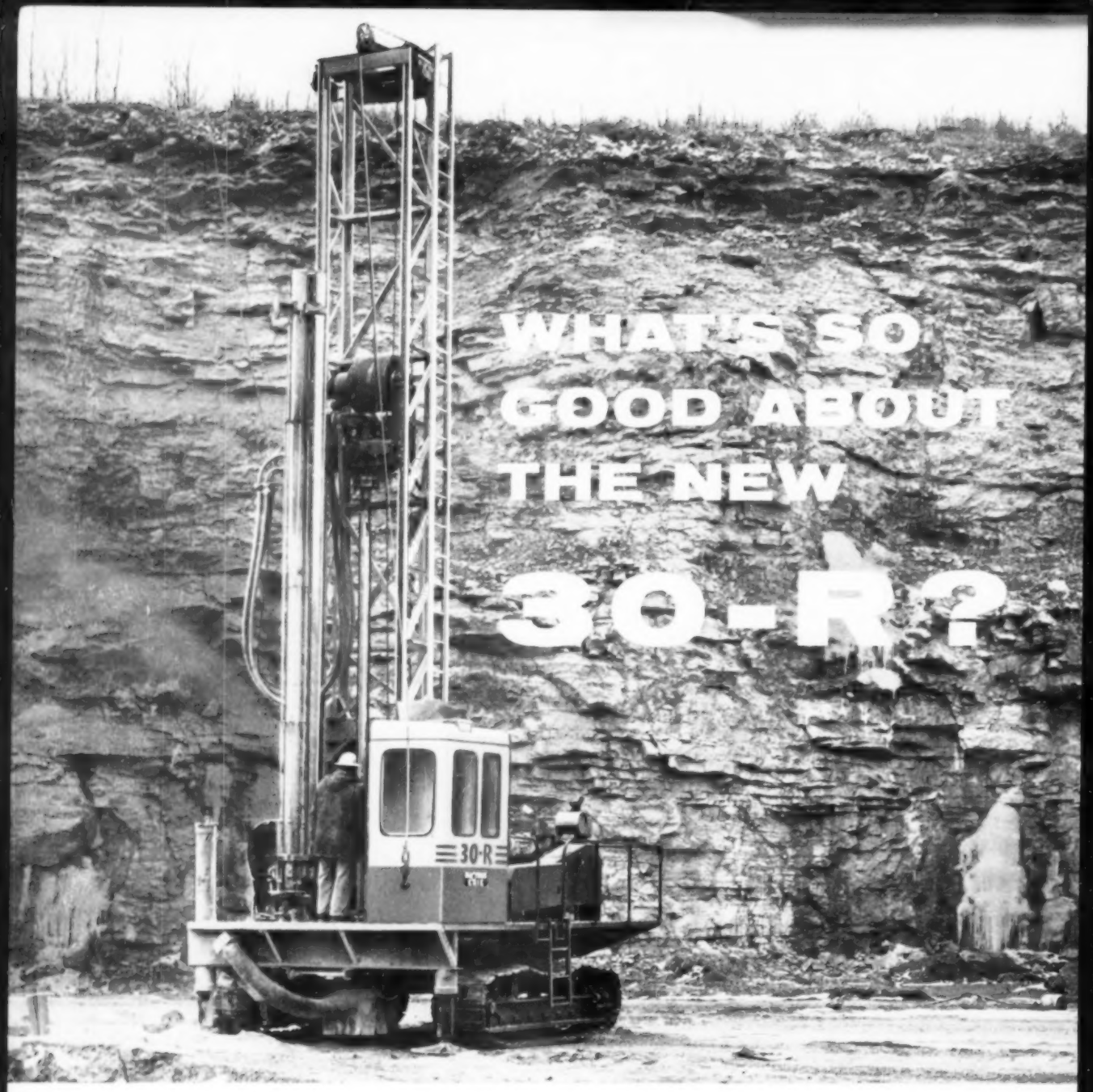
Excavating Engineer

founded 1905

MARCH 1960

Dragline cuts a trench within a trench for 60-in. diameter sewer pipe. For story of sewer modernization program in Little Rock, Ark., see page 13.



The new Bucyrus-Erie 30-R Rotary Blast Hole Drill gives you more feet of hole per dollar invested than any other drill in its class . . . and isn't that what you *really* want from a drill?

WHAT MAKES IT SO GOOD?

It comes naturally. The 30-R is patterned after two of the most popular and productive rotary blast hole drills in the business — the famous Bucyrus-Erie 40-R and 50-R. Its performance advantages include 30,000 lb pulldown force . . . continuous drilling for 21 feet, 3 inches before adding new pipe . . . infinite selection of speeds from 0 to 100 rpm . . . instant stabilizing and leveling with three hydraulic jacks . . . *plus* stamina that just won't quit.

Let your Bucyrus-Erie distributor show you many other reasons why the new 30-R is so good, or write Bucyrus-Erie Company, Dept. 1B60, South Milwaukee, Wisconsin, for descriptive literature.

BUCYRUS ERIE

MOST RESPECTED NAME IN THE INDUSTRY

There's a reason WHY in MacWHYte Wire Rope*

It brings out the best in your equipment!

Just as you use specialized equipment for a particular job, it pays to use the right kind of wire rope designed for that equipment.

All wire rope isn't the same. There are changes in the construction of wire rope . . . which aren't obvious to the eye . . . but can seriously affect the way it will work on your equipment. Because all equipment isn't the same, different types of rope are required because of basic design variations.

With this in mind, you can see the reason "why" Macwhyte offers such a wide variety of wire rope:

* Every foot of wire in Whyte Strand is specially drawn, cold-worked by Macwhyte in their own wire mill. Complete processes — from raw material to finished wire for rope — are under the watchful eyes of Macwhyte metallurgists.

* Special lubrication is available in accordance with the needs of the equipment or the type of service in which the rope will be used. The tenacious lubricants provide just the necessary protection — are unaffected by heat or cold, dry or wet conditions.

* Product engineers determine the exact number, size, and relationship of the wires needed to meet the requirements of your equipment. You're sure of the correct size, strength, and flexibility.

* Entire wire and rope mill operations are concentrated on the making of wire rope in a thousand and one sizes, grades, and types . . . to give you the rope you need.

Result: Whyte Strand wire rope is literally "custom made" for shovel hoist rope, dragline, clamshell crane rope, boom hoist line, dozer rope, scraper rope, contractors' hoist and derrick rope, overhead cranes, cableway excavators, and winch lines. If you'd like to check the type of rope recommended for your equipment, send for bulletin 5702 — free for the asking.

191

MACWHYTE Wire Rope COMPANY

2900 Fourteenth Avenue, Kenosha, Wisconsin, U. S. A.

Cat DW21-PR21 units handle rock "on the double"

Increasing production is one of the soundest ways to cut quarry costs. Caterpillar DW21 Tractors with Athey PR21 Rear Dump Wagons were designed to help quarry operators do just that. Here's why:

They're big, rugged and an easy shovel target. They have a low center of gravity and are maneuverable.

The payoff of these features is in top production. For example, on the job pictured below, there were three Cat DW21-PR21s at work. The units were required to maneuver in limited room on benches and steep haul roads. Material included shot rock and sandstone. On haul lengths averaging 300 yards, the units handled 275 cu. yd. an hour.

DW21 Series G now 345 HP

Now the DW21 Series G is matched to the 22.5 cu. yd. PR21 for even faster production on the toughest jobs. Compared with the model it replaced, it has new HP—345 (maximum output) for an increase of 8%. It also has 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Equally important, the horsepower increase was achieved without any sacrifice whatsoever in the excellent torque characteristics of the Cat Engine.

Get the complete facts on the Cat DW21-PR21 from your Caterpillar Dealer. Ask for a demonstration. Pick a tough job—see for yourself how this giant handles the hard work!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS

LOAD FAST! PR21 offers a big target. Short non-stop turns of DW21-PR21 unit speed spotting under shovel and work on a narrow bench. PR21's special steel withstands impact, abrasion and corrosion.

ROLL FAST! Two of three DW21-PR21 units on the job. DW21 combines high travel speed with excellent torque characteristics. The PR21 has a 22.5 cu. yd. heaped and 62,000 lb. capacity. All this adds up to fast cycles, top production.

DUMP FAST! PR21 has hydraulic hoists for quick and complete dumping of any material. DW21's hydraulic steering facilitates maneuvering. Wide-section, tubeless tires provide maximum flotation and sure traction.

Advertisers

IN THIS ISSUE

Allis-Chalmers 10–11

Bucyrus-Erie Co. ... 2nd Cover, 22–23, 37–40, 62–63

Business Publications Audit of Circulation, Inc. 4

Caterpillar Tractor Co. 2, 17–20, 58–59, 71

Drake-Williams Mount 51

Eimco Corp., The 49

Euclid Div., General Motors Corp. 30–31

For Sale (Classified) 66–69

General Motors Corp., Euclid Div. 30–31

Hammerblow Wire Rope Cutter Co. 72

Hendrix Mfg. Co. 5

Hercules Powder Co. 8

Ingersoll-Rand Co. ..... 3rd Cover

Koehring Div., Koehring Co. 6–7

La Crosse Trailer Corp. ..... 4th Cover

LeTourneau-Westinghouse Co. ... 55, 57

Macwhyte Co. 1

Marion Power Shovel Co. 9

Sauerman Bros., Inc. 53

Excavating Engineer

founded 1905

South Milwaukee, Wisconsin

CONTENTS

Volume 54 No. 3 **March 1960**

Big Sewers for Little Rock—by L. H. Houck 13

High water table, tough clays hamper excavation portion of $4.4 million sewer system modernization program that is designed to meet the city's estimated needs for the next 20 years.

'I-System' Job Has Big Hilltop Rock Cut 24

When Yonkers Contracting Co. began grading an interstate road over New Jersey's Jugtown Mountain, President E. J. Petrillo assembled a showcase spread of trucks, shovels, drills.

Tower Excavator Digs Waterway Channel 32

Machine moves 12 yards of earth approximately 800 feet in a single operation.

North America's Largest Inland Dredging Job Nears Completion 34

Caland Ore Co. will soon begin mining high grade iron ore from the Falls Bay area of Steep Rock Lake, where two 36-in. dredges have been working around the clock for five years.

Draglines Straighten Missouri River Bend 41

New channel for Missouri river north of Omaha is creating an island that will become a government-sponsored hunting, fishing and recreation center for sportsmen in the metropolitan area.

Majestic's Mile-a-Day Pipeline 46

Wabash River country job hits fast pace despite water troubles and caving banks.

Ex-Laffs Page 48

Why Crankshafts Fail—by W. E. Irwin 50

News from the Field 52

Illinois SAE Group Meets 52
Army Orders 180 Crawlers 52
AMC Announces Coal Show Plans 52
Round-the-Clock Operations Planned at Panama Canal 54
Diesel Engine Tips 54
Present Moles Awards 54
Construction Men Honored 54
Highway Department Gets Radio System 56
Brush-Burning Fan 56

Equipment You Ought to Know About 60

Notes from the Manufacturers 69

Not in the Contract 70

New Trade Literature 72

Copyright 1960 by Bucyrus-Erie Company. Published monthly at South Milwaukee, Wisconsin, U.S.A. Single copy price, 35 cents. Regular subscription (payable in advance) $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscriptions. Indexed by Engineering Index, Inc. Volumes available on microfilm.

H. A. BURKHARDT, Publisher

W. C. VAN DYKE, Sales Manager

W. E. WILLIAMS, Editor

D. M. CRAWFORD, Assistant Editor

E. W. ARNDT, Art Editor

H. LINDQUIST, Staff Photographer

Circulation of Excavating Engineer is audited by Business Publications Audit of Circulation, Inc. BPA

Everybody profits ...because

you belong

in this picture!

The publisher of this magazine is often asked what kind of a man you are . . . and how many like you are receiving his magazine.

Why is he asked?

Because the *advertisers* (whose money is his chief income) insist upon knowing the types of people (by industry or profession, by title) for whom the magazine is edited — and how many are getting it.

In order to standardize on the presentation of such information to advertisers and to have its accuracy vouched for by a disinterested third party, nearly 450 publishers have joined some 200 leading advertisers and advertising agencies in a non-profit organization called Business Publications Audit.

The purpose of BPA is to assure advertisers . . . by frequently checking and rechecking . . . that each member publisher is indeed distributing his magazine, in the *numbers* promised, to the *types* of men he promised would receive it.

The BPA symbol in this magazine means that *you belong* . . . that because of your occupational interests you are qualified, in the eyes of the advertisers, to receive it.

The advertiser can thus tell whether he's getting his money's worth.

The publisher has a better sales story to prospective advertisers because his magazine is "audited."

And you, the reader, get more value from the magazine because both the advertisers and editors, knowing what your special occupation is and what your interests are, are better able to prepare advertising and editorial material that will be most informative and useful to you.

What you can do

Publishers and advertisers frequently write to magazine readers to learn what kind of articles and advertisements appeal most. Cooperate with them — will you? — by answering their questions . . . in the interest of better communications between makers and markets.

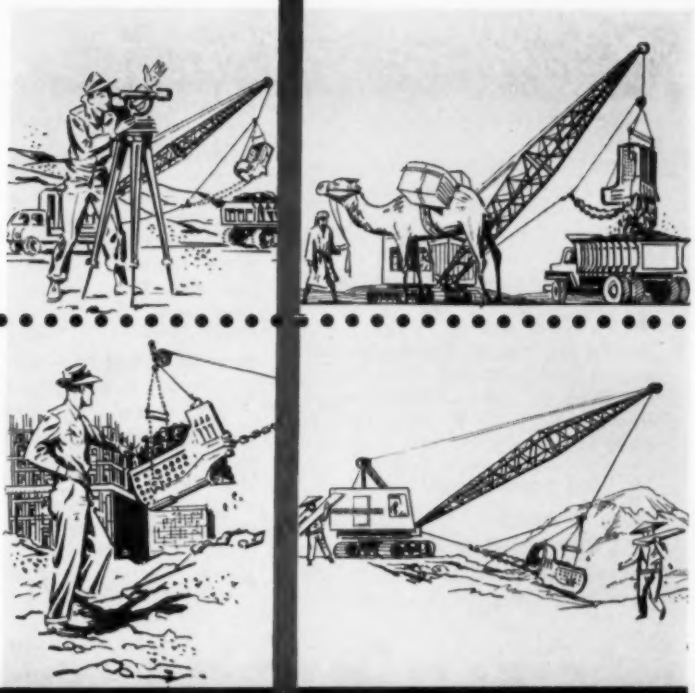
BUSINESS PUBLICATIONS AUDIT OF CIRCULATION, INC.

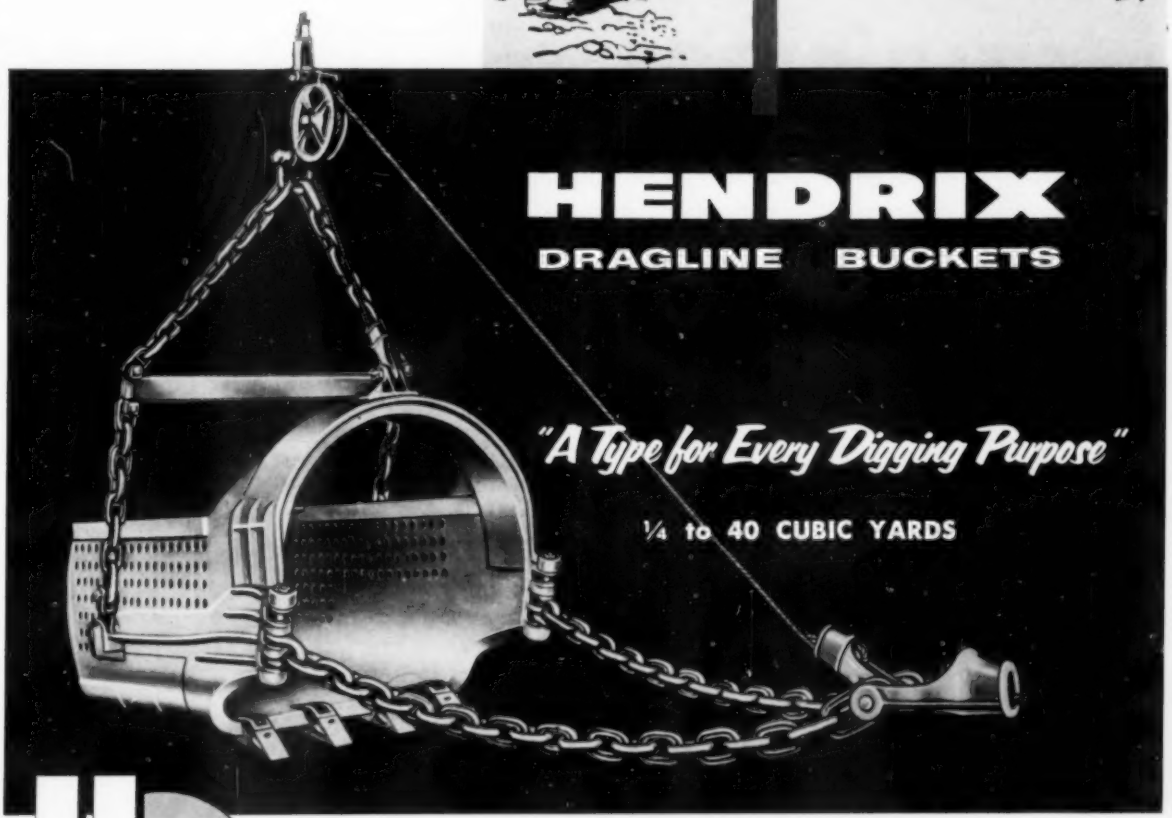
420 Lexington Avenue New York 17, N. Y.

BPA

A NON-PROFIT, TRIPARTITE MEMBERSHIP CORPORATION OF ADVERTISERS, ADVERTISING AGENCIES AND BUSINESS PUBLICATIONS

MATCHED
to the job.....
UNMATCHED
for service





Hendrix Lightweight Dragline Buckets

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

1 SKOOPER loading solves split coal seam problem

IOWA — a split seam of good quality bituminous coal created a real loading problem in large open-pit mine. Top seam — about two feet of coal — was separated from bottom seam by a two-inch layer of fire clay. Conventional shovel loaders mixed clay in with coal, caused too high an ash content. Solution — Koehring 205 Skooper! Its 7-foot level crowd took off top coal seam, fast, without mixing in clay. No ground grinding skid-turn action of tractor loaders, either, because full revolving Skooper swings through complete loading cycles without track movement.

15-yard truck loaded out every 3 minutes

TEXAS — Loading packed caliche out of stockpile, Skooper heaped 15-yard trucks in about three minutes. That's five yards a minute with an excavator which is basically a ½-yard machine!

2 400 tons an hour with only 64 horsepower

OHIO — On highway construction, Koehring 205 Skooper was clocked loading loose borrow into trucks. Time studies showed a production rate of 400 tons an hour for the 64 h.p. machine equipped with 2½-yard rehandling bucket!

Keeps production high at sand and gravel plant

UTAH — Loading pit-run material at a Utah sand and gravel plant, Skooper's continuous production dig-swing-dump cycles let operator load trucks at top efficiency all day long. No late-afternoon drop-off, common with front-end tractor loaders. Skooper power is concentrated on digging effort, not on traveling.

3 Macadam break-out easy with 7-ft. level crowd

LOUISIANA — Preparatory to repaving city street, old macadam surface was peeled off and loaded out by Skooper alone. There was no ripping or breaking ahead of the machine. Skooper's powerful bucket action provided all necessary break-out force. Its 7-foot level crowd also helped maintain grade, kept dozer and grader work down to a minimum.

COLORADO — With a similar pavement removal problem, an alert Colorado contractor also used Skooper with equally good results! Loaded heavy oil-saturated blacktop, kept one lane open to traffic during construction.

4 Steady diet of foundry sand

ILLINOIS — Skooper owner has long-term contract to supply used foundry sand from industrial plant

.....FIELD REPORTS PROVE *there's*

KOEHRING

yard. He sells it to other contractors for use as subgrade material on parking lots, roads, etc. Skooper replaced a tractor front-end loader on this work. Owner reports Skooper not only compares favorably production-wise with the old machine, but maintenance and fuel costs are substantially lower! It's an ideal high-production application for full-revolving, free-swinging Skooper. Plenty of reach for loading the big, high-sided trailers, too! Clearance height under roll-over bucket is 12'-10" at beginning of dump — and more than 10 ft. after dumping.

5 Cleans ditches, trims banks along state highways

KENTUCKY — Highway department's Skooper has just the right combination of advantages for below level ditching, grading shoulders, trimming banks. Bucket reaches below grade, above grade, cuts at any angle of bank slope. "Standstill" digging cycle with 360° swing for dumping into trucks speeds every assignment — keeps one lane open to traffic while work is underway. This same machine solved a real emergency last Spring.

Cleared landslides

Heavy rains caused a road maintenance nightmare along Kentucky's Ohio River valley. Tons of soggy mud and debris came tumbling down, blocking sidehill roads. Railroad tracks downhill, closely paralleling roadway, prevented dozing debris over the edge. Material had to be loaded out, hauled away in a hurry. Skooper was brought in — quickly cleared one lane — let traffic through while it cleared second lane. Big, wide bucket easily handled largest boulders, stumps. 7-foot level crowd did a smooth job on final-grade cleanup. Emergency solved, Skooper moved on to next assignment!

Mail now to:
KOEHRING DIVISION,
3026 W. Concordia, Milwaukee 16, Wis.

Send new Skooper catalog right away.

NAME .....

TITLE .....

COMPANY .....

DIVISION .....

STREET .....

CITY, STATE .....

K11 EE

Digging, stripping, loading, rehandling — Koehring® Skooper has proved itself on one job after another — from coast to coast, and overseas, too. Isn't it about time you checked what it will do for you? Better call Koehring distributor, or write us today.

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

nothing like it — on wheels or tracks!

SKOOPER

KOEHRING HEAVY DUTY

HERCOL®—A LOW-COST EXPLOSIVE—NOW AVAILABLE IN SMALL-DIAMETER CARTRIDGES

The Hercol series of low-cost, cap-sensitive, high-ammonia-content explosives are now available in cartridges of small diameters and standard lengths, as well as in the larger diameters and special packings.

The ability of Hercol to produce excellent fragmentation, its water resistance, Class 1 fumes, and high cartridge count—plus its low cost—have already been proved to the economy-minded quarry and open-pit operator.

Now that Hercol is manufactured in the smaller diameters, with Class 1 fumes, these same economies are available to the underground operator.

Contact the Hercules sales office nearest you or ask your Hercules representative for more detailed information on how Hercol can reduce blasting costs for you, too.

Properties of Hercol

	Hercol	Hercol 2	Hercol 4	Hercol 6
Fumes	Good	Good	Good	Good
Cartridge count—1¼ by 8-in. cartridges per 50 lb.	130	120	140	165
Cartridge diameter, in.	4 to 8½	1 to 3½	1 to 3½	1 to 3½
Weight strength, %	70	68	68	68
Cartridge strength, %	48	50	34	19
Water resistance	Fair	Good	Fair	Fair

A special grade of Hercol is formulated for seismic "pattern shooting" when the drill-holes are relatively dry.

Explosives Department

HERCULES POWDER COMPANY

900 Market Street, Wilmington, Delaware

X860-1

BIRMINGHAM • CHICAGO • DULUTH • HAZLETON • JOPLIN • LOS ANGELES • NEW YORK • PITTSBURGH • SALT LAKE CITY • SAN FRANCISCO

Marion Reports . . . from India

TWO MARION 7200 WALKING DRAGLINES ARE SPEEDING UP CANAL CONSTRUCTION ON CHAMBAL PROJECT

CLEANING OUT THE BOTTOM OF THE CANAL.

Both the Superintending Engineer of the Project and the Assistant Engineer in charge of the draglines state that Marions are "first class pieces of equipment." The machines were sent to India under the Technical Cooperation Mission Program.

Within the past year, the first two Marion "walkers" sent to India have been put to work constructing canals for the Chambal power and irrigation project near Kotah. On completion in March, 1960, the project will provide 210,000 K.W. of power at 60% load and 1.4 million acres of water-starved farm land will be irrigated.

The part of the project where the two Marions are presently working includes two main irrigation canals, one on each bank of the Chambal River, and a vast network of small laterals. The right bank will be 232 miles in length and along with its distribution system is nearing completion. The left bank canal, which forks into two branches, is 120 miles long and is almost ready to receive water.

Presently working with 6 cubic yard buckets and 120-foot booms, the walking draglines are on either side of the right bank canal excavating 700 cubic yards of earth an hour. This canal will be 28 feet deep and 210 feet in width with a 154-foot bed. When this part of the job is completed, the "walkers" will be moved to a virgin saddle cut farther down the canal.

Marion is proud of its modest contribution to the great progress of India through the Chambal project. We'd welcome the opportunity to work with *you* and to recommend a Marion that will apply to *your* particular job.

You get MORE *with* MARION

MARION POWER SHOVEL COMPANY
Marion, Ohio, U.S.A.

A Division of Universal Marion Corporation

360
ALLIS-CHALMERS

GET POSITIVE PENETRATION AT CUTTING EDGE

The new, all-hydraulic TS-360 is the only motor scraper in the 30-yd class with double-acting bowl jacks that provide 2-way power for faster loading, more cutting control.

The TS-360's exclusive hydraulic down pressure penetrates quickly into the toughest-loading materials. Penetrating force like this—along with Allis-Chalmers original low, wide bowl—gives you fast, heaped loads every pass.

Slope-cutting is another good example! "Cornering-in" with bowl down pressure lets your operator sink his bit *when* and *where he wants* . . . lets him maintain the best cutting depth while loading. The result: Clean, accurate slopes.

Positive penetration is only one reason you'll get top performance on any size job. *Two-stage steering—forced ejection and highest apron lift—90° steer and* KON-TORK *differential* are earth-moving advantages you cannot afford to overlook.

Put this new 340-hp TS-360 to work for you. Move more dirt per dollar invested than ever before. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

KON-TORK is an Allis-Chalmers trademark.

move ahead with

ALLIS-CHALMERS

. . . power for a growing world

A new employee gave us the idea...

Several weeks ago, a young chap being processed by our personnel people—you know, for insurance, hospitalization and so forth—asked whether our company had a Payroll Savings Plan for U. S. Savings Bonds.

This simple question made us realize that while we had a Payroll Savings Plan available we had not promoted it lately among our employees.

We contacted the State Director of the Savings Bonds Division of the U. S. Treasury and discussed this matter. He helped us work out a promotion plan to contact every employee on the Payroll, and thereafter, each new employee we hired. He supplied literature, posters and so forth and helped train the canvassers to do an educational promotion among our employees.

In a short time, with practically no disruption of our business, our campaign was successful. The enthusiastic response floored us. This proved to us employees *want* to save part of their pay and they welcome the convenient Payroll Savings Plan for buying U. S. Savings Bonds.

Your State Director, Savings Bond Division, U. S. Treasury Department, will be glad to help you install The Payroll Savings Plan, or build participation in an existing plan. Write: Savings Bonds Division, U. S. Treasury Department, Washington 25, D. C.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

EXCAVATING ENGINEER

Excavating Engineer
founded 1905 MARCH 1960

Stringing crews unload the 8-ft. long sections of 60-in. diameter reinforced concrete pipe. Sections weigh 10,500 pounds each.

Big Sewers for Little Rock

High water table, tough clays hamper excavation portion of $4.4 million sewer system modernization program that is designed to meet the city's estimated needs for the next 20 years.

by L. H. Houck

A NEW city-owned sewage treatment plant and trunk line sewer system in Little Rock, Ark., solves a hatful of problems in this growing metropolis and places it in a favorable position for broader industrial and commercial development.

The new $5 million facility will also place Little Rock in the forefront in the national anti-stream-pollution program, and provide ample sewage capacity for 35 square miles of expected annexations to the city.

Little Rock's growing population is served by an inadequate sewage system that was further outmoded a few years ago when the Arkansas River shifted its channel and landlocked some sewage inside the projecting finger of a growing sandbar.

Little Rock's rapid industrial growth during the past 10 years produced another pollution problem in the southwestern and western sections served by the Fourche Creek drainage basin.

Burns & McDonnell Engineering Co., Kansas City, Mo., was engaged in 1957 to make a sewage system study; and subsequently its recommendations were adopted and are being implemented with bond issue funds.

The urgency of the sewage situation was emphasized in the report. It called attention to the overloaded existing main trunk line—a 60-in. line built in 1936—now filled to two-thirds of its capacity with storm and ground water infiltration during wet weather. The main would not handle the increasing flow for more than a couple years, according to the engineers' study.

The report proposed new 60-in., 48-in. and 30-in. mains to parallel existing trunk lines and predicted the new installations would handle all needs for the next 20 years or more.

The engineers also reported that a new primary treatment plant would serve for several years. But it should be built on a site of 50 to 60 acres to provide space for additional primary and secondary units when needed, the consultants urged.

The project was placed under the jurisdiction of the Little Rock Sanitary Sewer System with T. W. Clapham as manager. The first contract was awarded in July 1958 to Forcum-Lannom, Inc., Dyersburg, Tenn., on

Wellpointing was used during construction of this outfall structure at end of 60-in. outfall line which was more than 3,000 feet long. Headwall is protected by stone fill.

a low bid of $1,844,900, for construction of the treatment plant.

This modern, reinforced concrete plant primarily consists of a by-pass, screen chamber, plant pump station, grit chamber, primary clarifiers, sludge storage tank and mechanical sludge dewatering facility.

Pipeline jobs were divided into two sections. Contract for Section 1 was awarded to W. K. Ingram Construction Co., West Memphis, Ark., on Nov. 19, 1958 on a bid of $2,025,-925. Section 2 was awarded on the same date to Wade Lahar Construction Co., Tulsa, Okla., for $546,572.

Although bid in the name of W. K. Ingram Construction Co., the Section 1 work was done by the combine of Hardwick-Ingram Construction Co. of Sweet Home, Ark. Wade Lahar Construction Co. performed its work together with A & A Construction Co., Muskogee, Okla., under the title of Wade Lahar Associates.

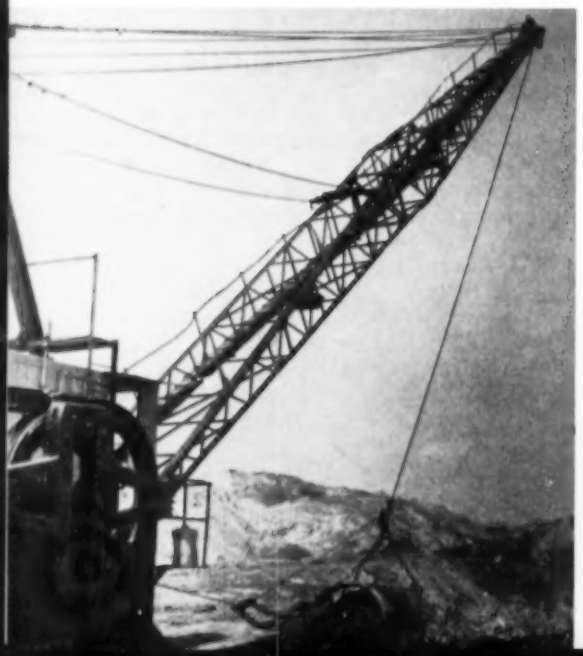
Hardwick-Ingram started work early in 1959 and had a year to complete the job. When visited by *Excavating Engineer,* work was two months ahead of schedule and had only a mile to go on the upper end.

Primary excavation for the sewer treatment plant by Forcum-Lannom introduced the first ground water problem. Located only 800 feet from the Arkansas River, the excavation was 50 feet deep and approximately 250 feet square, in silt and sand. The water table was 24 feet below the surface, and wellpoints were required.

A Griffin Wellpoint Corp. system was leased and installed, consisting of about 200 points placed in a two-stage arrangement and pumped with four pumps. Four million gallons of water a day were produced on a round-the-clock pumping schedule, and the water table fell 30 feet.

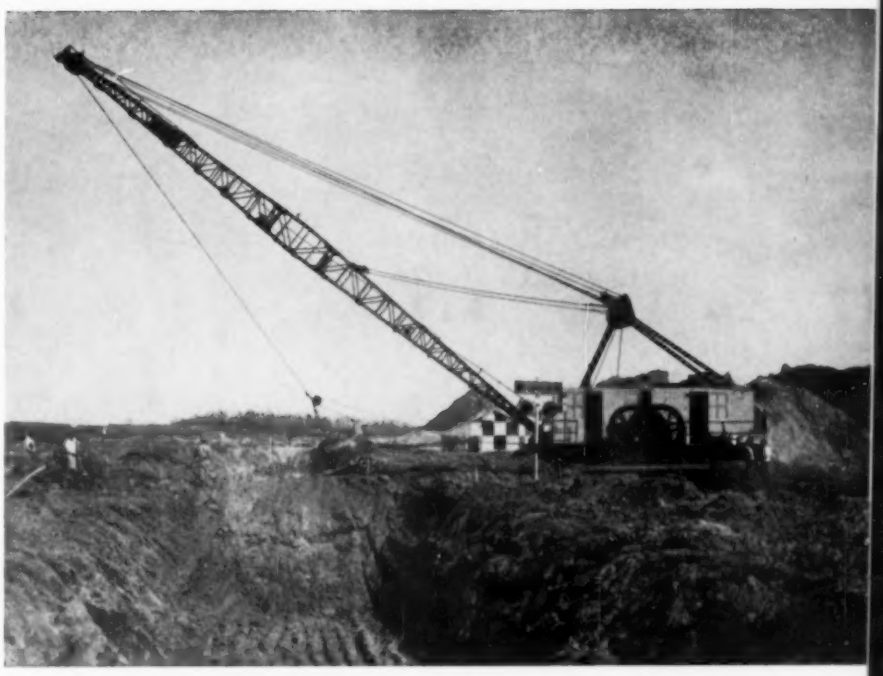
Treatment plant excavation was handled by three Northwest draglines. Two were model 6's; one carried a 60-ft. boom and a 2¼-yd. Hendrix bucket, and the other had a 70-ft. boom and handled a 2-yd. Hendrix bucket. One dragline worked in the bottom of the excavation and cast onto the bank, while the other picked up the material and stockpiled it for subsequent use as fill. The third

(Left) Walking dragline opens trench for 60-in. line. (Right) Contractor Frank H. Lee watches as Unit crane pours manhole.



Northwest, a model 95, was used in trenching. The excavation part of the job included a 3,165-ft. long trench for a 60-in. outfall line.

Principal quantities on the treatment plant job included 70,000 cubic yards of excavation for structures, 55,000 cubic yards of backfill, 10,000 cubic yards of concrete, 171,000 square feet of concrete forms, 550 tons of reinforcing steel. The pump station and screen chamber were put on slab footings, and the other structures were put on a total of 7,000 feet of monotube pilings.



Bucyrus-Monighan 3-W walker swung a 4-yd. Hendrix bucket built up to 5-yd. capacity. The Cat-diesel-powered machine with a 100-ft. boom, moved about 1 million yards.

Use Walker

Hardwick-Ingram started its 6-mile line of 60-in. reinforced concrete trunk main at the treatment plant, using a 3-W Bucyrus-Monighan walker powered with a D364 Caterpillar diesel. The machine swung a 4-yd. Hendrix bucket on a 100-ft. boom to open the initial deep portions of the trench. The bucket was built up with an 8-in. addition to handle 5 cubic yards.

Part of the trench was 80 feet wide and 30 feet deep with 1 on 1 side slopes, a 10-ft. wide bottom and a 10-ft. wide bench for well points half way up one side. The existing 60-in. line was intercepted and extended 1,970 feet to the new treatment plant.

A water problem, similar to that which plagued the treatment plant contractors, appeared immediately in the trunk line excavation.

Hardwick-Ingram sub-contracted dewatering duties to Moretrench Corp., Houston, Tex. Moretrench installed a single header line and four 10-in. Moretrench pumps, each powered with a General Motors diesel. Well points were driven on 10-ft. centers. This system operated 24 hours a day and lowered ground water 10 feet.

Well pointing was discontinued by Hardwick-Ingram when the trench excavation left the sand and silt zones and encountered a sticky red clay formation that did not lend itself to dewatering by the well point method.

Dewatering here was turned over to 15 or 20 Jaeger centrifugal pumps in 1½-in., 3½-in. and 4-in. sizes, powered wth air-cooled gasoline engines and attended by the regular work force. The pumps were used to suck from sumps in the bottom of the ditch and they effectively kept the water level down to workable limits. However, dragline buckets still had to tear out sticky clay masses, especially in the cover zones near the surface of the ground where excavation could only be classified as "tough digging." The lower zones in most cuts contained more sand and were comparatively dry.

Working from the treatment plant, men laid the first 2,000 feet of 60-in. concrete pipe on a concrete cradle about 7 feet wide and a foot thick to absorb some of the heavy weight of the deep backfill cover. This deepest portion of trench excavation was handled by the Bucyrus-Monighan with the long reach of its 100-ft. boom.

Works on Mats

While the main ditch was being excavated to 20 feet by the Bucyrus-Monighan walker, a model 6 Northwest with a 70-ft. boom and 2-yd. Hendrix bucket, worked on mats in the bottom of the ditch to cut a 10-ft. trench with a 1 on 1 slope ahead of the pipe.

Backfilling assistance in this section was given by a Bucyrus-Erie 30-B with a 60-ft. boom, used first to pull well points, then fitted with a 2-yd. bucket to place a 3-ft. layer of dirt on top of the 60-in. line. Sides were thoroughly compacted by a crew of four workmen with LeRoi clay tampers. Compressed air came from a LeRoi Tract-Air, a mobile machine which moved along the trench bank under its own power.

The 3-ft. preliminary backfill layer provided a cushion for the heavier dumps of fill up to 10 cubic yards each, dozed in by the D9. The preliminary backfilling afforded a measure of insurance against the breaking of seals or pipe that might be caused by dumping heavy loads directly on the exposed main.

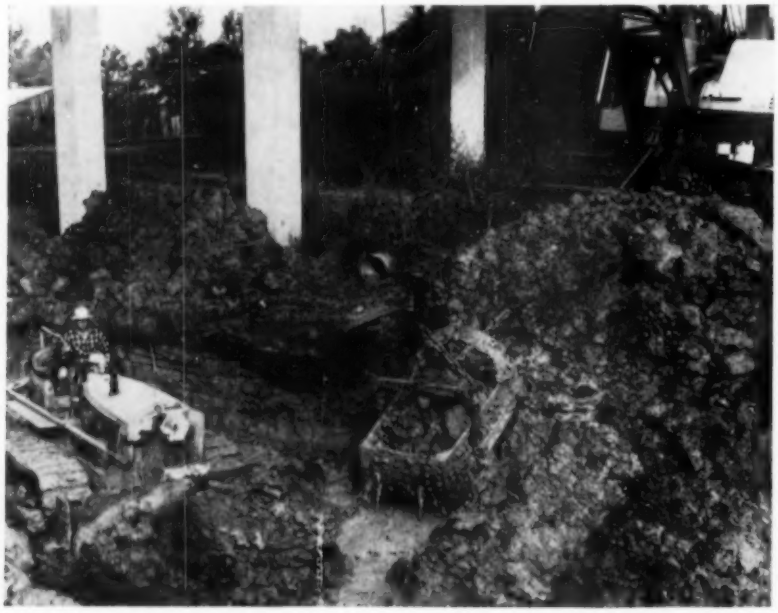
Earlier in the job the same 30-B, with a hoe attachment, had been used for trenching.

Principal highway and railroad crossings were tunneled. A total of 669 feet of tunnel was acquired, ranging up to 92 inches in diameter. Both Hardwick-Ingram and Wade Lahar sub-contracted their trunk line tunnels to Armco Drainage and Metal Products, Inc.

Three tunnels were necessary in each of the two contracts. The Hardwick-Ingram contract included one tunnel 130 feet long with a diameter of 92 inches. The longest tunnel in the Lahar job was 150 feet long and 68 inches in diameter.

Metal tunnel liners were all 9, 10

(Above) Northwest model 6 lowers section of 60-in. pipe into trench. (Below) Cat D7 dozes wet sticky clay and silt from under bridge while 30-B widens trench cut.



or 12-gauge Armco steel. Excavation was accomplished mostly with Worthington clay spades using air from a LeRoi compressor that also powered a ¾-in. Chicago Pneumatic impact air wrench used to bolt tunnel section rings together. Muck was carried out of tunnels in a side-dump bucket suspended from an overhead mono-rail.

Under Highway

Under the Wade Lahar contract, Armco placed a tunnel for 30-in. pipe under the Old Hot Springs highway, for 36-in. pipe under the new Benton highway, and for 48-in. pipe under Missouri Pacific railroad tracks. Tunnels on the Hardwick-Ingram job pass under the Missouri Pacific and Rock Island railroad lines and under U.S. highway 65. Tunnel diameters were 92 inches for 60-in. pipe, 80 inches for 48-in. pipe, 68 inches for 36-in. pipe.

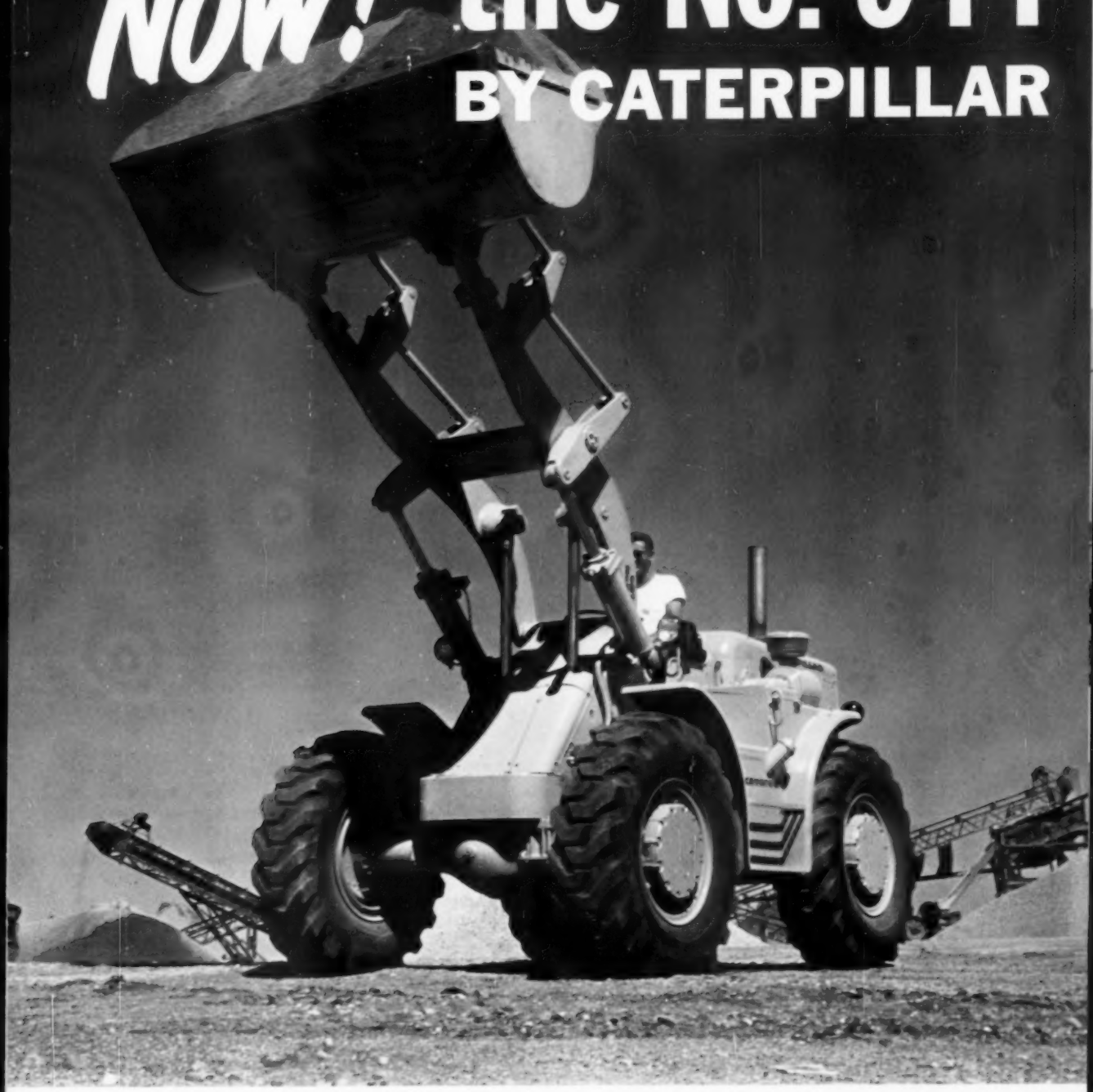
Reinforced concrete pipe required for the job totaled 51,060 lineal feet, in diameters from 60 down to 30 inches. To produce this volume of pipe, three pipe manufacturing firms established a joint venture company under the title of Little Rock Concrete Pipe Associates and built a plant in the city. Participants were Choctaw, Inc., American-Marietta Co., and Sherman Concrete Pipe Co.

All concrete pipe produced was reinforced with dual spiral steel cages, produced on a model SGC American-

Continued on page 21

W. F. (Red) Pannell, left, was general superintendent, and C. A. Davis job superintendent for Hardwick-Ingram firm.

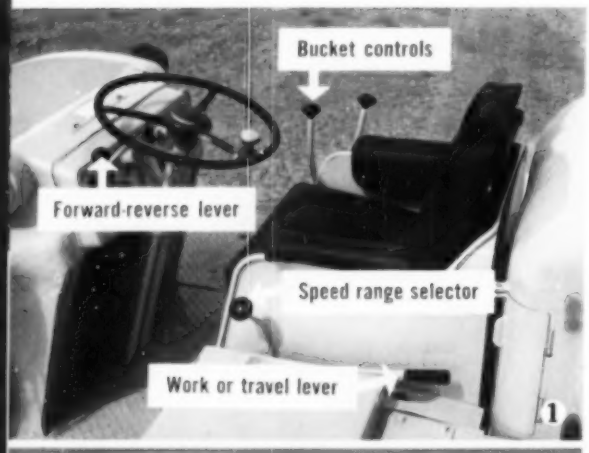
NOW! the No. 944
BY CATERPILLAR



THE *FIRST*
OF A NEW WHEEL LOADER LINE

the No. 944

...designed for action,



IT'S HERE . . . the Cat No. 944 . . . rated at 2 cu. yd. capacity . . . the first of a completely new line of equipment that will soon include the No. 922 (1¼ cu. yd. bucket) and the No. 966 (2½ cu. yd. bucket).

Watch for these new machines with the bold new design . . . they're ready to bring new standards to wheel loader operation.

Take a look at the No. 944's big, new features . . . features that give it lively response and make it the easiest and safest wheel loader to operate. See it in action at your Caterpillar Dealer. Ask him for a demonstration. See for yourself how the *new design* pays off on your loader jobs.

DESIGNED FOR ACTION . . . with plenty of power for both machine drive *and* bucket hydraulics. Choose from two great, new engines . . . the compact 4-cylinder diesel, turbocharged for maximum efficiency . . . or the 6-cylinder gasoline engine. Both are 105 HP units, fully equipped. Both are made to the same rigid standards. Whatever the requirements of your operation, there's a No. 944 powered to meet your needs.

Tailored to this power is the torque converter and power shift transmission, providing smooth, instant, finger-tip shifting. A full range of work and travel speeds is available on the No. 944. And reverse speeds are 25% faster than forward speeds . . . important in reducing cycle times. Travel Range gives 2-wheel drive for roading . . . Work Range automatically puts power to all 4 wheels.

Machine and bucket controls are located for easy handling(**1**)—the forward-reverse lever is mounted on the steering column.

Both bucket control levers have kick-out devices. The lift control releases at dumping height—the tilt control positions the bucket for digging. And for full bucket loads every pass the 2 cu. yd. bucket tilts back 41° at ground level. The high lift and *extra-long reach* make truck loading faster, easier.

There's plenty of action designed into the No. 944, ready to speed up your loader jobs.

DESIGNED FOR SAFETY . . . in the bold new lines(**2**). Bucket lift arms and pivot points are completely in front of the operator's area. This gives the operator new freedom of movement . . . greater all-around visibility.

Wide steps(**3**) make it safe and easy to get on or off . . . from either side. No need to climb over tires. Fenders provide a handy platform for checking the engine and they protect the operator from rocks and mud(**4**).

The No. 944 brake system gives safer, more precise control(**5**). The *left* brake neutralizes the transmission *as* it stops the machine. This gives superior loading action in extra-tough material.

Traxcavator safety, economy

The *right* brake leaves the transmission engaged . . . for full control when creeping, working on steep slopes or roading downhill.

These and other safety-bonus features give the No. 944 operator greater confidence, greater efficiency.

DESIGNED FOR ECONOMY . . . in the Caterpillar tradition. Sound engineering, modern design, service accessibility, quality construction, responsible parts and service coverage all add up to a new kind of stability—mechanical stability—in the No. 944. The many cost-saving features of this NEW wheel loader will pay off big in your operation!

Offered in a full line of versatile attachments and accessories are forks, cab(**6**) and special buckets, including the *exclusive side dump* that gives the No. 944 added efficiency.

BRIEF SPECIFICATIONS

Horsepower (Net)	105*
Bucket capacity	2 cu. yd.
Bucket reach (@ 7 ft. dump height)	50¾ in.
Over-all width (bucket)	93½ in.
Wheel base	88 in.
Speeds, forward (4)	0-24 MPH
reverse (4)	0-30 MPH
Weight, shipping (with diesel engine)	20,780 lb.
(with gasoline engine)	20,440 lb.

* For comparative purposes, the maximum rating of the D330 Engine used in the No. 944 is 135 horsepower.

6

THE No. 944 TRAXCAVATOR...

NEW IN DESIGN AND LOADED WITH PERFORMANCE

Learn more about it. Visit your Caterpillar Dealer the week of March 14

There's a wealth of LOADER KNOW-HOW behind the No. 944. It comes from the builders of the best accepted track-type tractor-shovels in the field.

Every feature is designed for *efficient work*. Plenty of horsepower . . . finger-tip shifting . . . smooth, fast bucket action . . . outstanding operator comfort and safety. The result is the bold, new No. 944 . . . the *outstanding* performer in its class!

For complete facts, see your Caterpillar Dealer now.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

DIESEL ENGINES · TRACTORS · MOTOR GRADERS
EARTHMOVING EQUIPMENT

A GREAT NEW PRODUCT IN THE CATERPILLAR TRADITION

Little Rock . . .

Continued from page 16

Marietta machine. Each steel spiral fabricated on the automatic machine consisted of two complete spirals produced simultaneously.

The pipe combine cast 32,500 lineal feet of 60-in. pipe in 8-ft. sections weighing 10,500 pounds each, and 9,000 feet of 48-in. pipe in 16-ft. joints.

Equipment used by the pipe manufacturer included a 45-ton model 795 American truck crane with a special 10-ft. elevated cab so the operator could see over the concrete forms. This machine was used to pour concrete and for general utility work. A Clark Ranger lift truck also poured concrete with a 2-yd. Gar-Bro bucket.

Hardwick-Ingram subbed manholes to Frank H. Lee Co., West Memphis, Ark. Manholes on the 60-in. trunk measured 5 by 7 feet inside to permit entry of pipe cleaning equipment.

Manholes Poured

Manholes were located at all changes of direction in the big line and at 500 to 700-ft. intervals in straight pipe. To pour the manholes, Lee used a small Unit crane with a 3-71 GM diesel engine and a ¾-yd. Gar-Bro concrete bucket. Concrete was delivered by Criss & Shaver Ready-Mix Co. of Little Rock, with International model 190 trucks carrying Smith 6-yd. transit mixers.

The Unit crane also assisted in stripping forms and handling the small pumps that keep the water level down while manholes were under construction.

This contract covered the 30, 36 and 48-in. pipe, and the job started 3,000 feet west of University and Asher avenues with a 30-in. reinforced concrete pipe run of 3,900 feet along Rock Creek.

Runs of the 36-in. pipe amounted to 1,600 feet, and 48-in. amounted to 14,000 running feet.

Lahar dug most of its trenches with a Murphy-diesel-powered Northwest 80-D. Sides were dressed with a model K Insley dragline and clamshell, boomed to 30 feet. Clay tampers compacting along pipe sides included LeRoi's with air from a Jaeger 75-cfm compressor. Pipe was placed by a Northwest model 6 powered with a Murphy diesel and carrying a 55-ft. boom.

Lahar backfilled with an International dozer with hydraulically controlled blade.

Pipe for the first 5,000 feet of 48-in. came from Lock Joint Co., Pine Bluff, Ark., and was supplied in 8-ft. lengths. This company also supplied 1,600 feet of 36-in. and 3,600 feet of 30-in. pipe in 12-ft. lengths. The rest of the 48-in. pipe was supplied by Concrete Pipe Associates in 16-ft. lengths.

Key supervisory personnel included T. W. Clapham, manager of the Little Rock sewer department, who represented the city. Burns & McDonnell Engineering Co., was represented by John McCann, resident engineer for the treatment plant, and William J. Luebbert, resident engineer for the pipeline work.

Forcum-Lannom, contractors for treatment plant construction, employed J. T. Canada as plant superintendent and Fred Webb as pipe superintendent. Hardwick-Ingram super was W. F. (Red) Pannell. John G. Elliot and C. A. Davis were construction superintendents.

Armco's superintendent was Bill Solman, and Wade Lahar's superintendents were H. J. Miller and E. G. Shetley.

(Above) Dozer works backfill near almost completed treatment plant. (Below) Months earlier, concrete was being poured for substructure in dewatered excavation.

going big?.

. . go electric

with Bucyrus-Erie!

. . . announcing NEW electric control that wipes slate clean on "can'ts" of old-style machines!

NEW CONTROL — only on Bucyrus-Erie electric excavators, a modern control that sets a new standard of electric operation to help you make every assignment more profitable!

SPECIFICALLY, with this new Bucyrus-Erie control there's no excessive heat loss, even in stall conditions. In tough digging, torque is increased, speed reduced — you move on through the digging cycle!

GRADUAL TURNS can be made on hard quarry floors in either direction without forward-reverse jockeying so often damaging to crawlers.

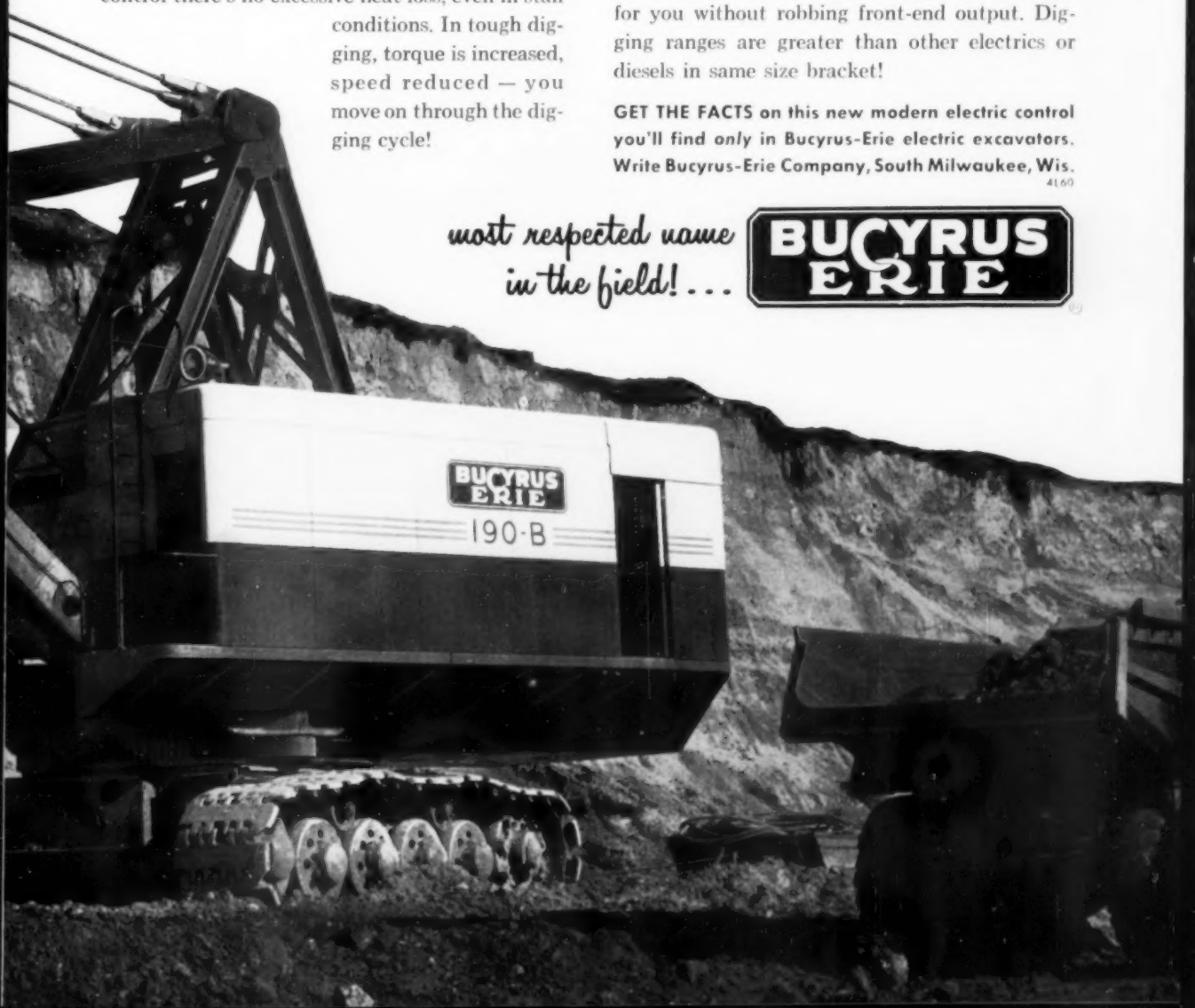
There are **NO OPERATING CLUTCHES** with this new Bucyrus-Erie control. Each function has its own power source. Power is used for that specific function — no other. You get full power up and power down for hoisting and lowering.

CROWD MACHINERY is mounted on the revolving frame, not on the boom. Weight works for you without robbing front-end output. Digging ranges are greater than other electrics or diesels in same size bracket!

GET THE FACTS on this new modern electric control you'll find *only* in Bucyrus-Erie electric excavators. Write Bucyrus-Erie Company, South Milwaukee, Wis.

4160

most respected name in the field! . . . BUCYRUS ERIE



'I-System' Job Has Big Hilltop Rock Cut

When Yonkers Contracting Co. began grading an interstate road over New Jersey's Jugtown Mountain, President E. J. Petrillo assembled a showcase spread of trucks, shovels, drills.

THIS spring, motorists on U.S. route 22 near Clinton, N. J., can glance briefly at an impressive sight as they guide their vehicles over the steep, winding pavement on Jugtown Mountain. Visible from the road is one of the biggest highway rock cuts currently under excavation in the East.

The big hilltop cut is for a new stretch of interstate highway 78 skirting present route 22, which by today's standards is obsolete and inadequate.

Almost 1.7 million yards of excavation are involved in this single long cut—and all but 200,000 yards of this figure represents hard rock digging. At its deepest point, the cut measures 127 feet.

At the west end of this man-made notch, there is another spectacular example of modern roadbuilding art. A super-size rock fill has been built up against the mountainside to eliminate a roller coaster dip. Rock blasted from the mountaintop is being piled up into this embankment, which will measure 600 feet at the widest point of its base and rise to a height of 107 feet. It will contain about 600,000 yards of rock in all.

Largest in State

This large-scale quarry-like highway work is being done by Yonkers Contracting Co., Yonkers, N. Y. The contractor is currently finishing up the grading of 4.8 miles of future interstate highway 78 through the scenic hills and valleys of Hunterdon county. The project, worth $6,379,960, has about 3½ million cubic yards of roadway excavation—which includes hard gneiss, shale and earth—plus about 500,000 yards of borrow.

Yonkers' job is the biggest single grading contract in the New Jersey state highway department's history. Federal-aid funds are paying for 90% of the cost under the financing provisions of the interstate program.

Nationally, interstate route 78 will extend from New York City to Cleveland, Ohio, where it joins interstate 80. All of I-78 will be limited access freeway, with no crossroads, traffic signals, center island openings or

Highway cut on Jugtown Mountain is a high-production scene as shovels carrying 5-yd. dippers load double-spotted Payhaulers.

Constant stream of Payhaulers shuttle between rock cuts and fill sites. The 18-yd. trucks are powered by 335-hp Cummins engines.

driveways connecting directly with the dual main roadways.

In New Jersey, the new freeway will run across the center of the state from the Holland Tunnel at the Hudson River to the Delaware River near Phillipsburg. Total length in New Jersey is 68 miles, and estimated cost is $388 million.

The section under construction, coupled with a four-mile stretch to the west just opened last October, will ameliorate eight miles of tortuous travel for both eastbound and westbound traffic now using route 22. The existing highway, which carries a high percentage of heavy trucks, is two lanes wide for the most part, undivided, and built with sharp curves and rolling grades that make passing extremely hazardous.

The steep grade of route 22 at Jugtown Mountain is well known to truck drivers trying to maneuver semi-trailers up icy pavement during wintertime. Long lines of stalled vehicles there are also vivid in the memories of many eastern motorists who have been caught in the jam-up.

Easier Grade

Maximum grade on the new interstate alignment for this area will be 4%. Reducing the rate of grade is accomplished both by cutting into the top of the mountain and by filling in its approaches.

Minimum graded width of the new super-road will be about 140 feet, to permit construction of dual 25-ft. wide pavements separated by an 84-ft. wide center island and bordered by 12-ft. wide shoulders and 10-ft. berm areas.

Yonkers' contract calls only for preliminary grading, drainage and some structural work. Actual paving of the roadway will be let by the state highway department under a separate contract.

(Above) International TD-24 crawler spreads rock. (Below) When completed, this fill will contain 600,000 yards of rock. Base width is 600 feet; height 107 feet.

While Yonkers' 3½ million yards of digging are labeled unclassified in the contract, the rock portion of this figure has actually been running about 75%. The right-of-way follows a rolling terrain, requiring deep cuts and fills. There are five major rock cuts, the largest of which is the one on top of Jugtown Mountain.

Excavating quantities and the fill requirements are fairly well balanced. A half-dozen sizable fill areas absorb

the rock removed from cuts; these built-up areas will also take some earth borrow.

Five structures are included in Yonkers' contract. Three of these are bridges which will carry local roads under or over the freeway; two are concrete box-culverts which cross small streams.

Two other bridges within the limits of the project are being constructed under a separate contract. They will take the interstate route over tracks of the Lehigh Valley and Central New Jersey railroads.

All phases of the record-breaking contract, awarded in November 1958, must be completed by Yonkers within 440 working days. The state highway department defines a working day as any day, exclusive of Saturdays, Sundays or legal holidays, when weather conditions permit a contractor to utilize at least half of his working force.

Yonkers' bid for the Jugtown Mountain job was almost $300,000 under the second low bid, and more than $1 million under many other contestants. While the job involves moderate-size structures and some earthmoving, the main body of the work is simply good, old-fashioned hard rock digging.

Therefore, Yonkers had to make the most of its rock excavation, paring the cost per yard to underbid its competitors—among whom were some of the best known names on the East Coast.

The suburban New York contractor is not only keeping up with the state's official progress charts, but is actually more than three months ahead of schedule at the present time. Excavation, which ran right through this winter, will be finished up this spring and a 4-in. layer of top-soiling placed on the roadway.

The story how the firm got ahead of the timetable is one of contractor know-how. It involves the elements of job planning; equipment selection; job organization; and equipment maintenance.

Let's look briefly at those factors.

A lot of smart planning for the job was done by the experienced Yonkers organization, headed by E. J. Petrillo, president. Prior to bidding, cost of equipment, materials, labor and other items were carefully calculated. Immediately after winning the award in late 1958, company officials began preliminary work at the site. Drills, shovels, trucks and scrapers were brought in during the '58-59 winter, so that excavation could get an early start in spring. A large 50 x 80-ft. Armco sectional steel building was erected to house a mechanical shop and administrative offices. A big spread of new equipment was purchased and job personnel appointed.

The winter months a year ago were spent stripping and opening up the cuts. First payload of rock was moved last March, far ahead of the normal start of the construction season.

A big block of rock from the loading face is eased into a truck body. Note width and depth of the cut here, and rugged appearance of banks which are gneiss granite.

Abrasive Rock

According to Project Manager E. A. (Red) Ellison, the basic formation is syenitic gneiss rock, a variety of granite which has a hard crystalline structure. "Gneiss," Ellison said wryly, "is hard to drill, hard to blast —and it's tougher yet on loading shovels and truck bodies. Its specific gravity? The stuff weighs 182 pounds per cubic foot."

Yonkers' project manager, incidentally, looks like he would be perfect casting material for the role of a job boss on a TV construction serial. Ellison has been in the construction field all his life (he was 40 last fall). "When I was 11 years old," he said, "my first job was washing parts in a contractor's shop."

The equipment spread marshaled by Yonkers for the job points up its "blitzkrieg" strategy of using big power shovels with a heavy entourage of hauling units. At the peak of excavation, the lineup of loading shovels consisted of three Northwest 80-D's

with 2½-yd. dippers, and a pair of Bucyrus-Erie 88-B's carrying oversize 5-yd. dippers. Also used for cleanup work and trenching was a Northwest model 6 hoe.

Each 88-B shovel, normally rated as a 4-yd. machine, was beefed up for the job by Yonkers with specially built Esco dippers. The machines were powered by 260-hp Cummins NVH-12-I diesel engines with torque converter drive; they had compressed air controls which made the operator's job much easier.

The big shovels were well matched to the heavy rock work. The broken granite nearly always had a tight digging toe, and it was hard to break out big boulders. But with a 5-yd. dipper, there was enough dipper capacity and bail-pull to handle the larger size rocks without time-consuming maneuvers.

Each 5-yd. shovel was moving 4,800 to 5,200 yards of rock per 10-hour day. Output of the smaller 80-D's, in proportion to their size, was also excellent—1,750 to 2,000 yards per unit each shift.

Esco 12M replaceable points for dipper teeth were changed every two days—normally 20 hours of the most brutal kind of service. Dipper bodies themselves required special armor. Strips of manganese alloy steel plate were welded inside the body, and the lips were hardfaced with manganese alloy rod.

Ellison commonly placed two or more shovels against a loading face. The broad width of the interstate roadway design permitted highly efficient loading practices. The roadway in rock cuts measured a minimum of 147 feet from toe to toe of the banks. This allowed plenty of room for backing in the end-dumps on both sides of each shovel. With double-spotting, no time was lost waiting for an empty to move up after a truckload pulls out; also the swing cycle was kept under 90°.

Project manager for the Yonkers firm on $6½ million job is E. A. (Red) Ellison.

Under these conditions, a 5-yd. shovel bailed 300 truckloads per 10-hour day even in hard, blocky rock. Loads averaging 19 cubic yards were completed in two-minute cycles.

A total of 25 rear-dumps—15 International 95 Payhaulers and 10 Euclid 66's, all rated at 18-yd. capacity—shuttled between the shovels and fill or waste areas. Hauls generally varied from 1,500 to 5,000 feet, although they sometimes reached a maximum distance of about 15,000 feet.

All Payhaulers had 335-hp Cummins NRTO diesel engines and torque converters. The Euclids had straight drives and GM diesels.

This number of rock-haulers wasn't large, considering the volume of material and the vast amount of overhaul—running into millions of station-yards. All pieces of the job—drilling, blasting and digging—were keyed to the massive carry-capacity of the truck fleet.

The Internationals and Euclids built up the fills in rock lifts not over 4 feet thick. Maximum size material allowable was 2 feet. Occasionally, there were pieces bigger than that, and they were worked wherever possible into the bottom of deep fills or were melted down by small-size shots.

Ellison said that daily production of rock rose steadily as the job moved along, and crews became more experienced and efficient. Early last summer, it hovered around the 15,000 yards per day mark. Last fall during good weather, it jumped to over 20,000 yards.

To keep in step with such a production pace, drill and powder crews had to move fast. Heavy drilling equipment was very much in order. Three large Ingersoll-Rand Crawl-

(Right) Ingersoll-Rand Crawlmasters drill 4½-in. blast holes. Previous shot here produced good rock fragmentation and a neat piling effect.

(Below) A Cat No. 14 grader blades away spillage from trucks to side of main haul road. Condition of the road is exceptionally flat and smooth.

(Above) Battery of Ingersoll-Rand Crawl-IR's, drilling 3½-in. diameter holes, levels off a prominent knob of rock. (Below) Air power from this stationary bank of six 600-cfm compressors is delivered to various drills on the job via pipeline.

master rigs with D525 drifters put down 4½-in. diameter holes. A Joy TM-550 truck-mounted drill produced 5½-in. holes.

The big cuts were drilled in 20-ft. deep benches to provide optimum digging height for shovels. Hole footage in the abrasive material averaged 15 feet per hour.

Smaller blocks of drilling were handled by a half dozen 3½-in. Ingersoll-Rand Crawl-IR units, whose mountings made them ideal for work on uneven rock surfaces and shallow ledges.

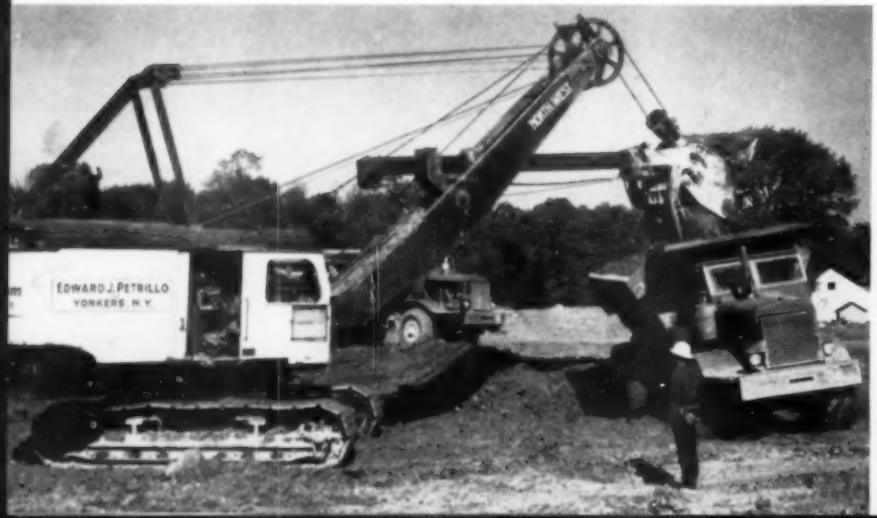
Air power for drilling came from a bank of six I-R 600-cfm compressors operating from a stationary location. Flow of air from the compressors was directed into a large 6-in. x 30-ft. pipe acting as a receiving tank. A quick-coupling pipeline taking off from this tank was strung out along the road alignment. This pipe was then tapped at various points by

flexible hose lines leading to the drills.

The team of six 600-cfm compressors were model CP-15's rebuilt to operate like, and repainted to look like, new. A 900-cfm compressor was also used as a mobile unit, so that total air output was 5,100 cfm.

Blast holes were generally spaced on a 9 x 10-ft. grid across the width of the cut. Powder factor was about

(Left) A 2½-yd. Northwest 80-D strips right-of-way. (Center) A subcontractor's truck crane pours concrete bridge abutment.



0.7 lb. per cubic yard of bank measure. Fragmentation was good, except where variations in rock structure dissipated explosive force.

Drillers and shovel operators took special pains to meet grade lines exactly so that the cut floor was left at or near finish grade in a single pass. Time-consuming, expensive backtracking was eliminated. Cut slopes were also dressed by dozers or graders as each rock lift was taken out.

Job headquarters was centered in the approximate middle of the project, just a few hundred yards off route 22. Administrative offices were housed in a wing attached to the high-class sectional-steel maintenance shop.

The building itself contained a parts and materials storage center, plus three large bays capable of handling all heavy equipment except the biggest shovels.

Armco sectional steel 60 x 80-ft. shop building is maintenance headquarters. Attached is an office wing. Three large bays allow space for overhauling heavy units.

Maintenance Staff

Yonker's maintenance program was aimed at spotting possible mechanical trouble and correcting conditions in advance. Under the watchful eyes of Charlie Pantana, master mechanic, six mechanics and four welders worked full 10-hour shifts.

Four men were kept in the field constantly during the day, taking care of minor problems while the others took care of overhauls and servicing at the shop. Every night, truck air filter cartridges were taken down and cleaned. Oil changes took place every 100 hours. All rubber-tired equipment was checked daily for tread wear and breaks.

The loading shovels received extra attention. Oilers assigned to the machines worked through the dinner hour, taking their lunch later, so they could lubricate vital parts like crawler base, roller swing circle and dipper stick. They also started earlier and quit later than the normal shift.

Lots of enthusiasm is evident in this group photo of mechanics and welders. Boss of the crew is Master Mechanic Charlie Pantana (center, holding equipment manual).

According to Charlie, shovels and hauling units were standing up well under the fast loading pace and abrasive nature of the broken rock. Equipment parts subject to abrasion, such as truck bodies and scraper pans, were reinforced with strips of manganese steel plate welded on by Pantana's corps of welders.

In addition to the truck-shovel loading, a fleet of seven 21-yd. Euclid S-18 scrapers was used on dirtmoving. Some portions of the job were on comparatively flat terrain where grading was relatively simple.

The fleet of tractor equipment also included 11 International TD-24 dozers and one Cat D9; two Adams and one Cat No. 14 motor graders; two Ferguson 50-ton compactors; a pair of double-drum sheepsfoot rollers; and various flat-bed and pickup trucks.

A resume of job officials includes Project Manager Red Ellison; Floyd Hilton, excavation superintendent; Alvin Pottle, project engineer; Charles Pantana, master mechanic; William Colvard, rock superintendent; and George Bishara, office manager. For the New Jersey highway department, Emile Benoist is resident engineer.

Growing Trend

In all its phases, the Jugtown Mountain job is an excellent example of large-scale "I-system" construction procedure. It demonstrates a growing trend among eastern roadbuilders toward moving ever-larger excavation quantities with equipment of commensurate size.

28 "EUCS"

BUILDING 11 MILLION YD. EARTH-FILL DAM

30 YD. BOTTOM-DUMPS ON LONG, HIGH SPEED GRAVEL HAUL...REAR DUMPS HANDLE BIG ROCK LOADS

Hills Creek Dam in western Oregon is part of the Willamette Valley Project under construction by the Corps of Engineers to provide flood control, navigation, power and irrigation. The embankment will require 11 million yards of earth and gravel fill and is scheduled for completion in 1961... it will be 2,400 feet in length and will have a maximum width of 1,600 feet at the base and 24 feet at the crest.

Green-Tecon, a joint venture of Green Construction Co., Des Moines, Iowa, and the Tecon Corporation of Dallas, Texas, have the earthmoving contract. These contractors are using a fleet of 28 Euclids on this big job . . . 13 Bottom-Dumps of 30 yd. and 7 of 17 yd. struck capacities and 8 Rear-Dumps of 22 and 27-ton capacities. The big "Eucs" work two ten-hour shifts six days a week . . . have marked up an excellent record of productive capacity and job availability.

Whether your operations involve big earthmoving projects like this one or small grading, stripping and industrial work, there's a Euclid model to match your requirements. Get all the facts and figures on the modern Euclid line of crawler tractors, scrapers, rear-dump and bottom-dump haulers from your Euclid dealer.

Six 27-ton and two 22-ton Rear-Dump "Eucs" haul rock from the quarry to the fill... all of these units are equipped with Torqmatic Drives and Torqmatic Brakes.

EUCLID Division of General Motors
Cleveland 17, Ohio

EUCLID (GREAT BRITAIN) LTD.
Lanarkshire, Scotland

A 7½ yd. dragline loads a Model LDT Bottom-Dump Euclid with 40 yds. of river gravel for 2½ mile haul to the fill. Green-Tecon have 13 of these big "Eucs" that are powered by 12 cylinder GM diesel engines of 432 h.p. with Torqmatic Drive.

Big loads of heavy gravel move over good haul roads at fast travel speed in these Bottom-Dump "Eucs". Torqmatic Drive — torque converter and semi-automatic transmission — provides full-power shift and a smooth flow of power to meet all road and grade conditions on the 5 mile cycle.

Well-maintained haul roads enable the Rear-Dumps to utilize their fast travel speeds on the 4500 ft. rock haul. On downgrades that are a maximum of 15% Torqmatic Brakes provide positive control of speed.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

(Above) Here is a portion of the approach channel to Jackson lock. (Below) Worker illustrates size of the 12-yd. Crescent bucket.

Tower Excavator Digs Waterway Channel

Machine moves 12 yards of earth approximately 800 feet in a single operation.

AN UNUSUAL method of channel excavation is being used at Jackson lock and dam, a Corps of Engineers replacement structure being built on the Tombigbee River near Coffeeville, Ala.

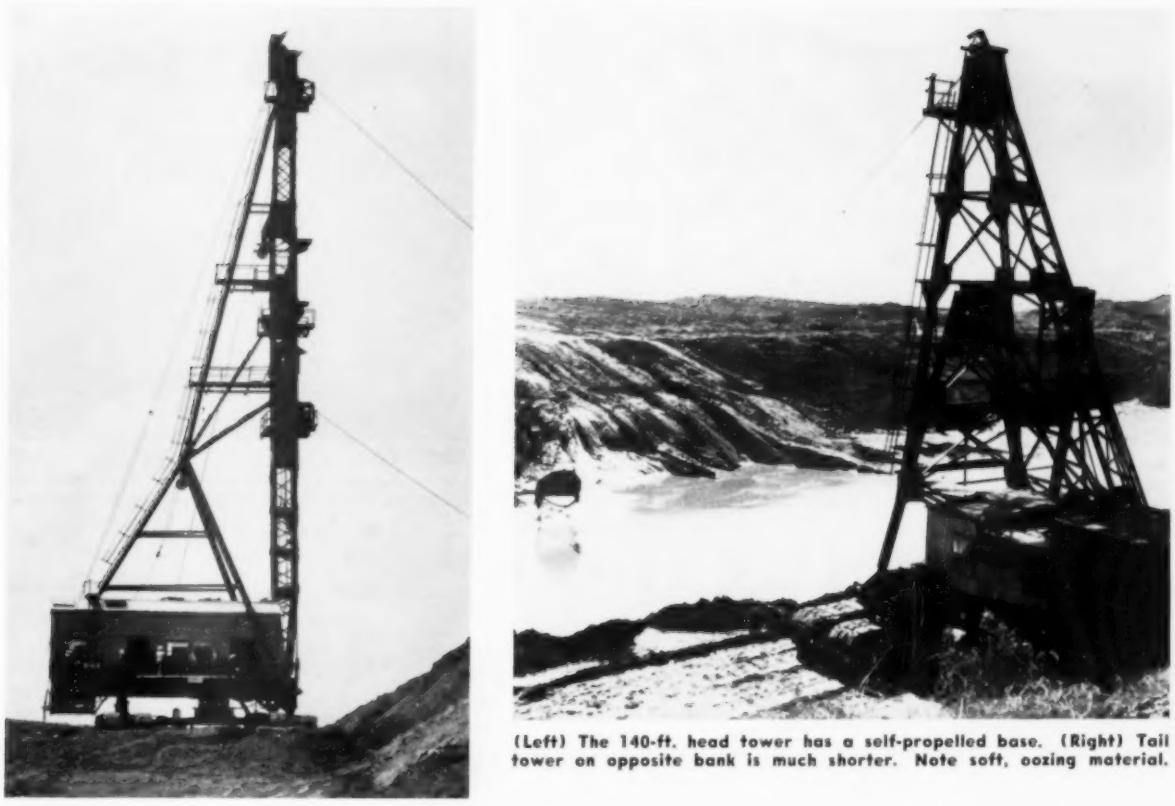
The approach channels for the lock are being excavated with a Bucyrus-Erie tower machine. The setup features a main or "head" tower about 140 feet high, mounted on four crawler-type trucks. Teamed with the head tower is a shorter "tail" tower mounted on a similar tracklaying base. A cable is suspended between them.

A Sauerman Crescent bucket, operated from a control room located about midway up the main tower, rolls on the cable to drag the earth from the excavation between the towers and pile it up in front of the main tower. The machine is capable of moving 12 yards of earth approximately 800 feet in a single maneuver.

The tower excavator has an interesting history. During the 1920's, two steam-powered towers were manufactured by Bucyrus-Erie for the Corps of Engineers to build levees along the lower Mississippi River. These early models gradually evolved into electrically-driven machines with DC motors for various operating functions. About 30 such electric towers were built during the 1930's. Some are still in use on river projects, in large sand and gravel pits, and in storage and reclamation of stockpiled materials.

According to B. W. Hamilton, coordinating engineer for the project, in the Corps of Engineers office at Mobile, the present use of the machine at the Jackson project is the first in the Mobile district.

The big tower is being used by



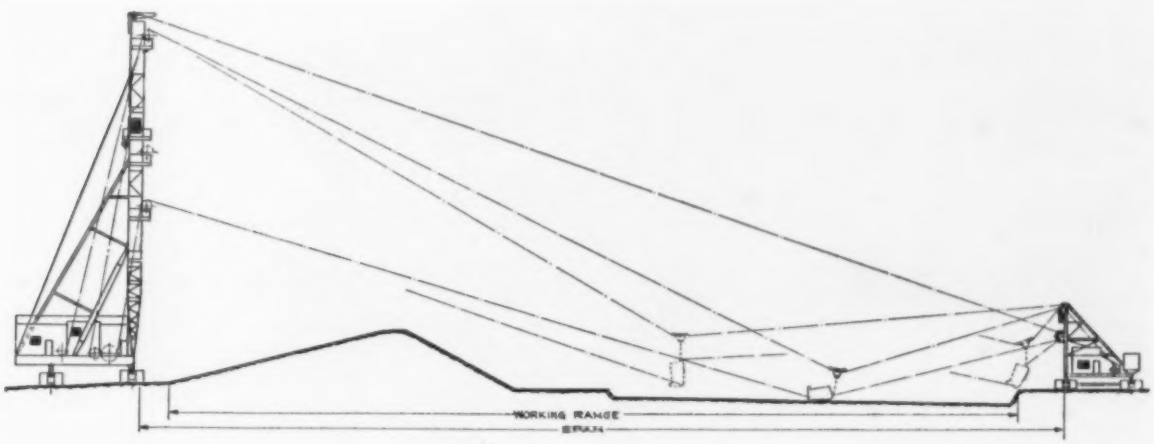
(Left) The 140-ft. head tower has a self-propelled base. (Right) Tail tower on opposite bank is much shorter. Note soft, oozing material.

the Farrell Construction Co., subcontractor of the Al Johnson Construction Co., Minneapolis, Minn., which has the prime contract for the lock and dam. Farrell planners decided this machine would be the most efficient equipment for excavating the lock approaches since the specifications allowed an uncompacted fill. The tower was moved to the site by barge, since its large size and great weight made it impractical to move it any other way.

Barge Route

The Jackson lock and dam project is a feature in the current modernization program on the Warrior-Tombigbee Waterway, which provides a barge channel between the manufacturing center of Birmingham and the port of Mobile. It is scheduled for completion in 1961 at an estimated cost of about $21 million.

Contracting officer for the Corps of Engineers is Col. R. W. Love, district engineer at Mobile, and Corps of Engineers resident engineer at the site is Ray E. Anderson. Superintendent for Al Johnson Co. is O. A. (Big Al) Johnson, and for Farrell Construction Co., F. E. (Curley) McMeans.



Diagrammatic view shows working range of the digging bucket. Excavated material is dumped on a pile in front of the head tower.

Panoramic view shows the dredges *Clarence B. Randall* (circle left), and *Joseph L. Block* (circle right) near completion of their five-year project. Iron ore deposits, mined below the lake bed, will be sent up the long conveyor (from right to left), past the new power sub-station (center) to be loaded into railroad cars (upper left) for shipment to Port Arthur docks.

North America's Largest Inland Dredging Job Nears Completion

Caland Ore Co. will soon begin mining high grade iron ore from the Falls Bay area of Steep Rock Lake, where two 36-in. dredges have been working around the clock for five years.

DURING the last decade, American steel mills jumped their production capacity approximately 28% to keep pace with mounting industrial demand. Many sources of high grade iron ore, once plentiful in easily-accessible deposits, have been exhausted. Strong demand has compelled the industry to turn to extensive development of new sources, often despite extremely difficult conditions. A steel firm facing this problem, Chicago's Inland Steel Co., looked to Canada to fill its needs.

Inland Steel's Canadian subsidiary, the Caland Ore Co., Ltd., will soon begin mining high grade iron ore from deposits starting more than 500 feet below the original lake surface of the Falls Bay area of Steep Rock Lake in western Ontario. Steep Rock Lake is about 175 miles north of Duluth, Minn. The job of removing vast layers of silt from the lake bed has kept 250 men and two 36-in. dredges working around the clock for five years in temperatures as low as 50° below zero.

At the job's end, these dredges will have displaced enough silt to fill a line of 5-ton dump trucks extending 2½ times around the world.

During 1960, which will be Caland's first year of actual production, about ¾ million tons of ore will be mined. Shipments will eventually rise to three million tons per year.

Silt-Laden Lode

Identifying these deposits and getting to them for development were two very different matters. As late as 1939, the presence of overlying water and silt presented seemingly insurmountable obstacles to practical mining operations.

The monumental task of draining Steep Rock Lake began in 1943. The lake consists of three arms or bays which form the shape of the letter M. Two of these bays are known as the West and Middle arms. The easterly arm is better known as Falls Bay.

Engineering studies prior to 1943 showed that the best bet for mining development was the Middle arm, which is the shallowest of the three.

Steep Rock Iron Mines, Ltd., of Atikokan, pioneered the dewatering-dredging work, and has been producing hematite ore from the basin of the Middle arm by open-pit methods for about a decade. Development of the East arm or Falls Bay section, which is much larger in area, began more recently.

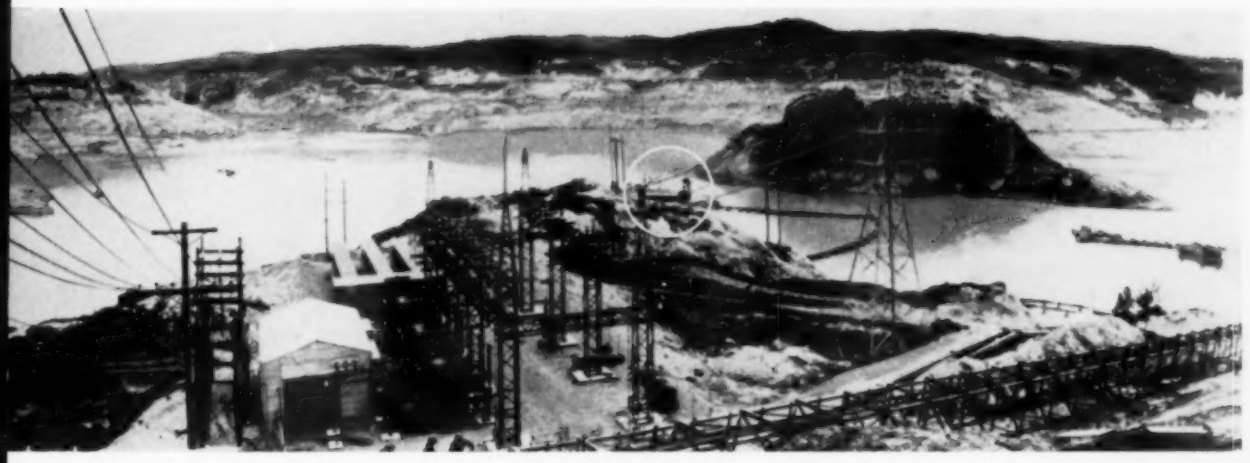
In 1949, Inland cleared the way for full exploitation of Falls Bay area. Probing the 1,250-acre region was assigned by the parent firm to Caland—its newly-formed subsidiary.

Investigation revealed that a gigantic dredging job—far greater than the Middle arm program—had to be undertaken preliminary to creating an open-pit mine.

Simultaneously, a three-phase plan was devised to open up and work the ore deposit. These phases were:

1. *Water Control:* establishing dams, spillways, silt settling basins, control stations and other diversionary and control measures to keep the development area dry while allowing return drainage of water from the lake for pumping purposes.

2. *Construction:* building a five-mile railroad spur connecting the mine with the Canadian National Railway; a major black-topped high-



way to connect Falls Bay to the town of Atikokan (base of operations located about eight miles south); and a 3,000-ft. all-weather air strip.

3. *Development:* installation of a giant 5,000-ft. conveyor to carry ore from the pit; erection of a crushing station to reduce the size of the ore for more convenient handling; erection of a loading plant for the loading of cars; and sinking of a 1,334-ft. underground shaft to serve a future underground mine (ore will initially be mined from an open pit mine).

Immensity of the dredging project can only be compared with that of the Panama Canal, largest inland dredging job ever undertaken.

However, while work on the "Big Ditch" involved the removal of 220 million cubic yards of earth, it took 20 dredges 10 years to complete the task. Caland planned to displace three-quarters of that amount (160 million cubic yards) with only two dredges in half the time.

Long Discharge Lines

The job called for the disposal of silt from Falls Bay by a pair of 36-in. dredges, with discharge lines nearly four miles long, into Marmion Lake. Water from Falls Bay, used to flush out the silt, would then be permitted to drain back into its original bed to be re-used. In this way, the water body would be emptied and refilled 10 times before the overburden of glacial silt was removed.

By mid-1955, much of the preliminary work had been done, including construction of a 140-mile, 115,000-volt power line from Port Arthur (on Lake Superior) and a new sub-station at Falls Bay. Work was well underway on the highway, air strip and water control system. At this point, the 36-in. hydraulic pipeline dredges, *Clarence B. Randall* and the *Joseph L. Block* were assembled on the scene.

They were named, respectively, for the former and the present chairman of the board of Inland Steel Co.

These dredges were specially designed by the Ellicott Machine Corp., Baltimore, Md., with machinery (cutters, winches, ladders and pumps) constructed by Ellicott. Construction Aggregates Corp., of Chicago, served as agents for Caland Ore in construction of the dredges. CAC also operates the equipment at the dredging site. Each unit is 50 feet wide, 176 feet long and 14 feet deep, with a draft of 5 feet. Each weighs about 900 tons. Their 10,000-hp electric

Original depth of the basin is shown here by trees marking the shoreline. Water level was lowered 340 feet at this stage.

motors consume power sufficient to supply a community of 60,000 people.

Within three years, the *Randall* and *Block* had lowered the level of the lake from El. 1267 to El. 920, exposing the first outcroppings of iron ore. Pumping an average of 60,000 gallons of water per minute, they disposed of approximately 60,000 yards of silt a day.

The water control phase had progressed, too. Three dams at the northern end of Lake Marmion and a spillway had been constructed, forming a settling basin 25 miles square. This prevented the silt-laden dredge discharge water from entering and contaminating nearby rivers.

Fairweather Dam and Fardy Dam, and several smaller auxiliary dams, were built to prevent surface run-off water from entering Falls Bay. Newly-built control stations at neighboring Marmion Lake and two other intervening lakes permitted the dredge water to drop its load of silt and flow back into Falls Bay to be used again.

Completion of Caland Highway and the air strip had narrowed the distance between Falls Bay, Atikokan and the rest of the world.

Final Phase

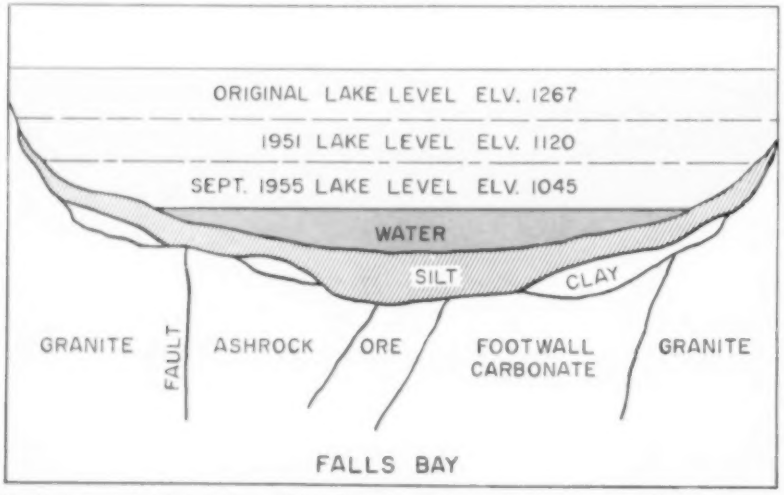
At present, only about 10 million yards of silt remain to be dredged from Falls Bay. Outcroppings of ore are plainly visible, and the lake no longer resembles the fisherman's haven it once was.

Since dredging began, combined dredge outputs have averaged 4,000 yards per hour for light materials and 3,200 yards per hour for gravel and boulders. The *Randall* and *Block* have removed approximately 150 million yards of overburden through pipelines that have averaged 5,000 feet of floating line and 10,000 to 15,000 feet of shore line. This does not include the vertical rise between booster stations, which during the past year has been 500 to 600 feet.

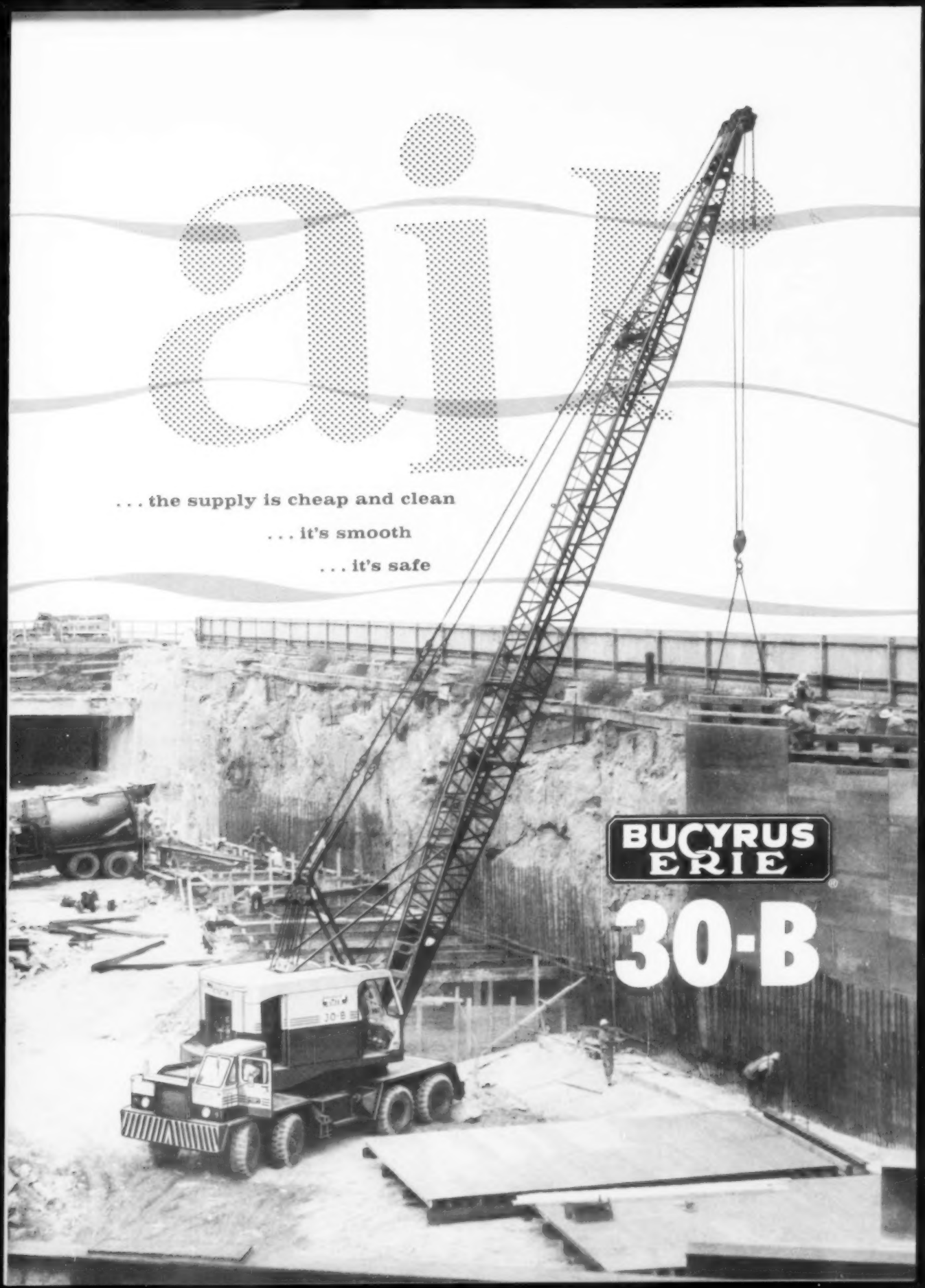
In a few months, the first shipment of iron ore from this new source is slated to move from the strip mine, through the new crushing plants, across the giant conveyor and into waiting railroad cars at the loading station. From there it will move to Port Arthur and other Lake Superior ports where it will be loaded on the long lake boats for shipment to Inland Steel furnaces.

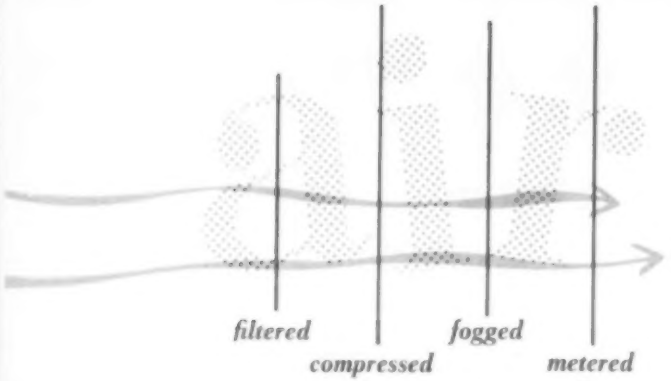
The *Joseph L. Block* has a discharge line nearly four miles long that carries silt to a disposal site. Each of the 36-in. dredges is powered by 10,000-hp electric motors.

The *Clarence B. Randall*, like its twin, is 50 feet wide and 176 feet long. It weighs 900 tons and has a 26-ton cutterhead. Its ladder can dig up to 50 feet below surface.



Typical cross-sectional view of the bottom of Falls Bay shows the thick covering of silt removed by dredges to get at ore deposit 500 feet below original lake level.


air
. . . the supply is cheap and clean
. . . it's smooth
. . . it's safe
BUCYRUS ERIE
30-B



Here's what Bucyrus-Erie does with air control to put extra money in your pocket!

"Engineered" air? Take a look! Bucyrus-Erie filters air to make it clean — to keep your lines clean; anti-freezes it to keep it working for you in coldest weather; compresses it to make it do more work for you; fogs lubricant into the air to keep cylinders alive longer; meters it out in just the amounts you want — no sudden bursts.

item one:

MICRO-SET SWING CLUTCHES TO SUIT THE OPERATOR

Every operator works differently, with a different touch. Here's a machine that lets the operator set the "feel" of the swing clutches just the way he wants it! Once control pressures are set, he gets the benefit of metered control valves, graduated to give him all the precision and sureness he needs on the tough jobs.

item three:

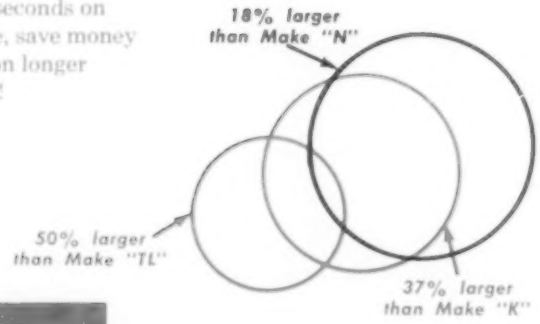
A CLEAN AIR SYSTEM; SIMPLE, LOW COST TO OPERATE

The Bucyrus-Erie 30-B was *designed* for air, not adapted for it! You don't have an oversize compressor to rob you of engine power. The simplicity of the system eliminates return lines, minor leaks are no longer a major problem, no special servicing is required to keep the system in top-notch operating condition. Anti-icer in the system prevents lines from freezing in cold weather!

item two:

BUCYRUS-ERIE 30-B SWING CLUTCHES ARE FROM 18 TO 50% BIGGER THAN COMPETITION

But that's not all — they're two-section giants designed to engage a split second apart, smoothly, positively. You save seconds on every cycle, save money and time on longer clutch life!



item four:

QUICK-SHIFT SWING TO PROPEL

Air power again goes to work to speed up the operation on a 30-B crawler excavator! With the move of one lever, the operator can shift from swing to propel and back again, a real timesaver on trenching jobs. You get many of the advantages of independent propel without the extra cost. If you need independent propel you can get it with the 30-B.

30-B

***SINGLE-LEVER CLAMSHELL CONTROL** now available on big Bucyrus-Erie 30-B to make entire operation more efficient!*

Bucyrus-Erie air control on the 30-B can make new men of your operators because the machine is so easy to control all day long. 30-B air control will make new operators of your most skillful men, too, because the machine is so simply controlled, giving them confidence unknown before. You owe it to yourself to take a close look at what the Bucyrus-Erie 30-B air control does in action . . . how other functions of the machine are coordinated to make this the finest machine its size you can consider!

item five:

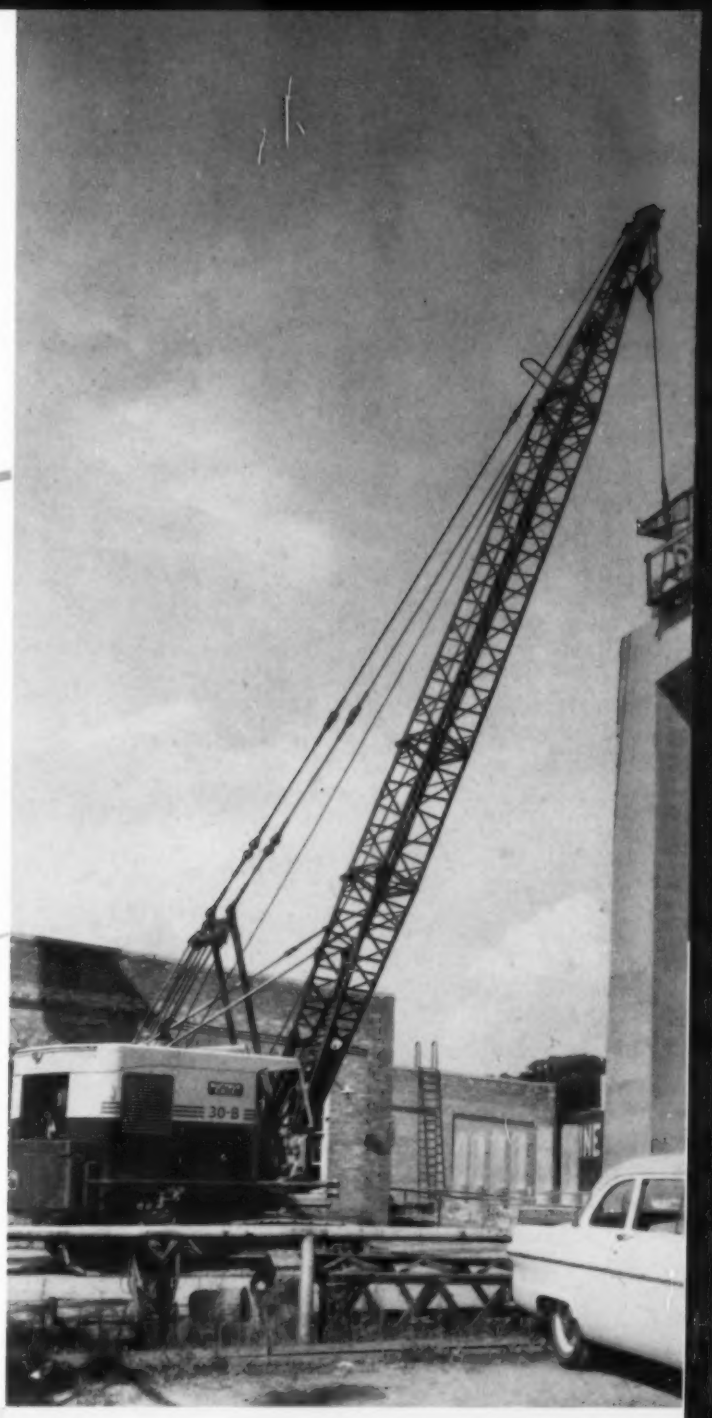
SMOOTH, POSITIVE, INDEPENDENT AIR BOOM HOIST

Here's a high-speed boom hoist that's safe, sure and quiet! The 30-B single-lever, full air-controlled boom hoist *powers boom up . . . powers boom down* through big friction clutches — hoists without complicated, auxiliary units! Optional equipment gives you additional variable speed control for specific special applications. Graduated valve on air control lets you engage and disengage as gently as a hand operation!

item six:

GEARS ALWAYS LUBRICATED BECAUSE THEY "FLOAT" IN OIL

Gear life can be directly dependent on the amount of care and attention given to periodical lubrication. With the Bucyrus-Erie 30-B, gear lubrication is *automatic* because all gears on the machinery deck are enclosed and running in oil. The deck stays clean, the gears last years longer, you put extra profits in your pocket through time saved, parts costs eliminated.



These are some of the reasons why experienced men say, "We've got real confidence in this rig!"

See who said it, and why . . . . . .

30-B

J. E. Hocutt, 13 years an operator of all kinds of excavators. R. G. Brown, Jr., & Company, Louisville, Miss.

"It's a dandy machine, no two ways about it! This 30-B's the easiest machine to operate that I've ever worked. Those air controls do the trick in *any* kind of digging!"

This 30-B is loading fill for an Interstate project, loads nine rear-dump trucks — fills one every 35 to 45 seconds (three passes). Machine has never been down, operates almost continuously.

Gerosa Crane Service Co., Inc., Bronx, N.Y.

Operator stated, "Even with this load I have every confidence that it will be handled without trouble! On these lifts, loads were boomed out twenty feet to clear the wall and no tilt showed in the chassis — and in spots we were working on pretty soft ground."

Gerosa's 30-B placed three Murray boilers — weight 28 tons each — from flat cars to trailers, removed and placed them at the new IBM Research Center, Yorktown, N.Y.

Willard F. Stoneburner, operator, Murphy Bros., Spokane, Wash.

"Operating a 30-B is easy. All you have to do is sit there and guide it."

This is the third 30-B purchased by Murphy Bros. in 1½ years. Machine is digging 12 to 15 feet, through dirt and hardpan, for installation of 30-in sewer pipe averaging over 200 feet per day.

Litho in U.S.A.

11-E-60

Who is the Bucyrus-Erie Distributor?

Your Bucyrus-Erie distributor may not be the largest or the smallest equipment house in the territory . . . that isn't the point! He's a *qualified* Bucyrus-Erie distributor and *that is the point*. It's a big reason why you are making an investment in your future with Bucyrus-Erie.

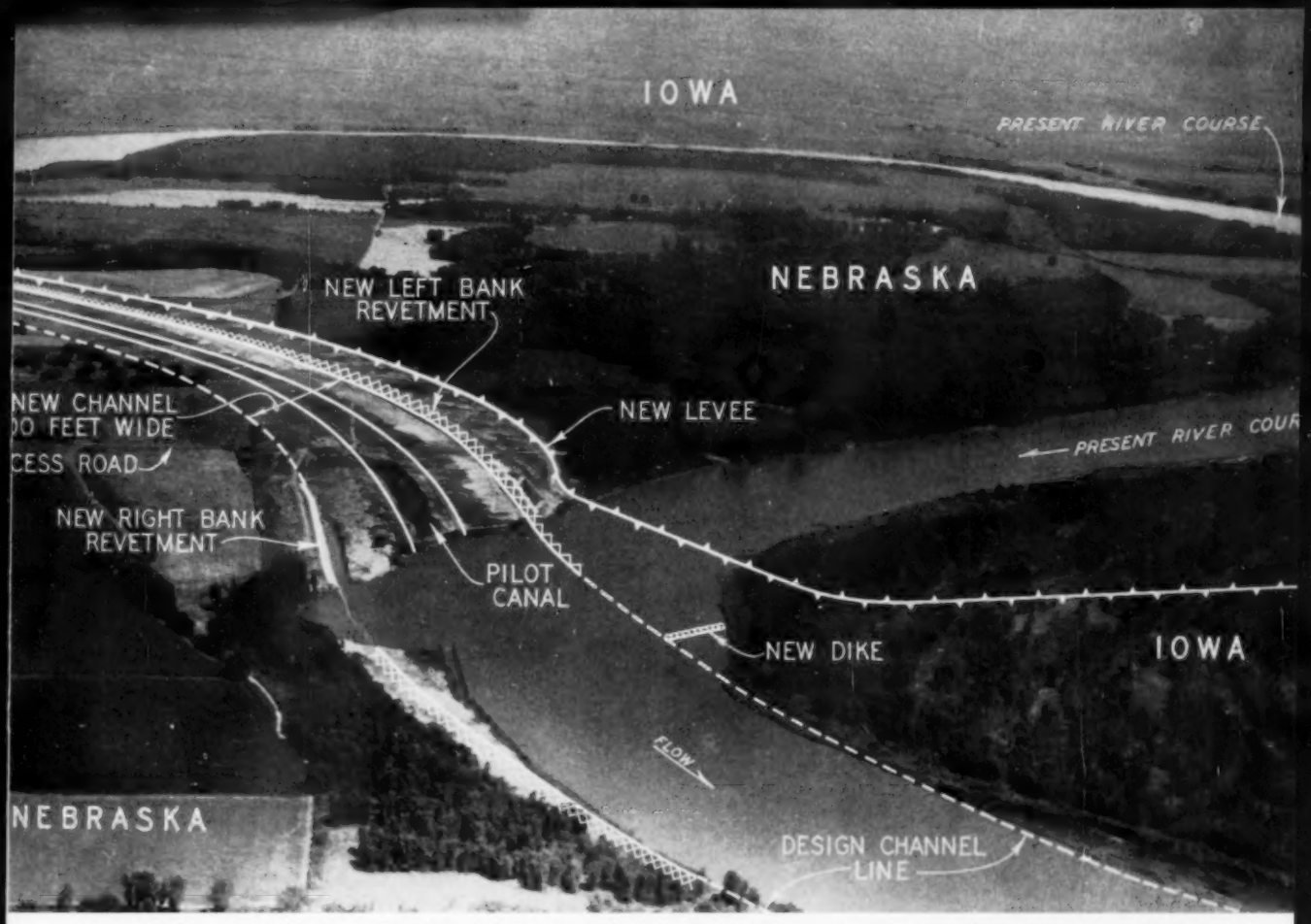
Your B-E distributor has men trained to help you put the machines to work properly . . . he has servicemen trained at the factory or by special service training representatives to give you the kind of help you need for maximum availability. He stocks more parts than any other crane-excavator distributor to keep your machines on the go.

Bucyrus-Erie distributors can be a big factor in profits from your machines. Consider these facts, and call on your local distributor or on Bucyrus-Erie Company at any time for the kind of service that puts profit-insurance into every assignment!

PLAN NOW TO MAKE AN INVESTMENT IN YOUR FUTURE WITH

BUCYRUS ERIE . . . *most respected name in the industry*

South Milwaukee, Wisconsin



A new island, surrounded by an ox-bow lake, is being created as draglines cut a new course for the Missouri river near Omaha.

Draglines Straighten Missouri River Bend

THOUSANDS of Nebraska and Iowa sportsmen will be among the chief benefactors of a government sponsored project now underway on the Missouri river about 20 miles north of Omaha. On the job three big draglines are cutting a new course for the Missouri—a 2½-mile channel that will eliminate an existing 7-mile bend.

The new channel is part of a U. S. Army Corps of Engineers program that will eventually establish a 9-ft. navigation channel on the Missouri from Sioux City, Iowa, all the way down to St. Louis, Mo., to accommodate the ever increasing volume of commercial river traffic.

The new channel will create a large island and a 900-acre ox-bow lake in the present riverbed. The island, so far unnamed, and the surrounding area totaling more than 7,000 acres, will be taken over by the Fish and Wildlife Service of the U. S. Department of the Interior for use as a wildlife refuge and recreation area to serve the nearby Omaha-Council Bluffs metropolitan area. It will be known as the DeSoto Wildlife Refuge.

Cooperating agencies include the National Park Service, the Bureau of Sport Fisheries and Wildlife, the Iowa Conservation Commission, the Nebraska Game, Forestation and Parks Commission and private sportsmen's groups.

Work on the new channel, known now as the DeSoto Cut-off, began last summer and is scheduled to be completed this April. Construction of new levees will continue through this year, and work on roads and buildings for recreational use of the DeSoto refuge is scheduled for next year. Plans call for completion of these facilities and first public use during 1962.

Three prime contracts were let by the Corps of Engineers Omaha district office for work at DeSoto Bend. Digging the pilot canal which will become the new river channel is Western Contracting Corp., Sioux City, Iowa, which won the job on a

New channel for Missouri river north of Omaha is creating an island that will become a government-sponsored hunting, fishing and recreation center for sportsmen in the metropolitan area.

(Left) Bucyrus-Monighan 5-W cuts trench for revetment that will protect bank.

bid of $448,527.30. Construction of levees along the new channel and seeding the area is also included in the pilot canal contract.

A contract for construction of a trench toe revetment and about two miles of levee was awarded to a joint venture team comprised of Eugene Luhr & Co., Columbia, Ill., and Midwest Construction Co., Nebraska City, Neb., on a bid of $469,688.75.

Cunningham-Kiewit Co. of Omaha, Neb., was the first contractor on the scene with a $544,037.95 agreement calling for construction of pile and stone fill dikes and revetments at DeSoto Bend and Upper Calhoun Bend, the two ends of the new channel.

Digging the big ditch for Western Contracting are a pair of Manitowoc 4500 draglines—identical twins except that one of them, a one-year-old machine, carries a 120-ft. boom, while the other is two years older and is fitted with 140 feet of boom.

Diesel Powered

Both Manitowocs swing 6-yd. Hendrix perforated buckets. Cummins V-12 diesels power each of the 145-ton machines. The 4500's are mounted on crawlers with treads 60 inches wide. Twenty-five feet of each track is on the ground at once. Wire rope of 1½-in. diameter is used for drag cables, 1¼-in. for hoist cables.

Western's superintendent, Jim Nutt, reports that the Manitowoc twins each move an average of 435 cubic yards an hour. His operators work in eight-hour shifts six days a week, and the job is proceeding ahead of schedule with a minimum of down time and few delays due to bad weather. The weather was poor enough but it did not hamper the output of the draglines. The pilot canal advanced an average of 100 feet a day under Nutt's schedule. Total length of the cut is 13,340 feet with about 1.8 million cubic yards of excavation.

The pilot canal is 24 feet deep, and 80 feet wide at the bottom. Side slopes are 1 on 3 for the bottom 12

(Center photo) Shown with the 6-yd. Hendrix bucket are Luhr-Midwest Superintendent George Ray, right; Oiler Jack Stewart, left; and 5-W dragline Operator Clyde Hammett. (Lower photo) Gradall spreads stone to protect newly cut bank.

Here's how the pilot canal looks to a dragline operator. The river will sweep down this canal and swiftly cut a new channel.

feet, 1 on 1 for the remainder. Rain and seepage tend to fill the canal to the natural river level despite plugs that are left in at intervals. Constant pumping keeps the water level down to about six feet in the new channel.

The Hendrix buckets carry an average of about 5½ yards per pass, an output satisfactory to Nutt who noted that much of the digging is under water. The material encountered is chiefly sand and silt with occasional pockets of gumbo. Average weight of the material is 3,700 pounds per cubic yard.

Clears Area

Besides the two Manitowocs the only other piece of earthmoving equipment on the job for Western is a Cat D9 dozer used to level spoil piles and clear working areas for the draglines.

As the draglines advance along the arc of the new river course, a 22-in. diesel-electric dredge was scheduled to enter the pilot canal to make a final cut of seven additional feet, making the pilot canal bottom 12 feet below the Missouri river surface. On April 10 the upstream plug is scheduled to be removed letting the mighty Missouri race into its new channel.

The river drops 7½ feet between DeSoto Bend and Upper Calhoun Bend. This drop, now spread over the seven mile natural course of the river, will then be pressed into 2½ miles giving the old river enough added punch to cut new banks far wider than the present pilot canal and to reach an eventual width of 700 feet in the DeSoto Cut-off.

After the 200-ft. plug is removed, Western's dredge the *Western Scent*, will enter the newly formed lake and close its upstream entrance with a dredge fill embankment across the former riverbed. The dredge will then build another embankment to close the downstream end of the ox-bow lake leaving a small exit for itself and finishing the job from the river side. The *Western Scent's* pumps, driven by four 1,000-hp electric motors, move about 1,500 cubic yards of material an hour.

The dredge fill embankments will reach about five feet above the surface, and their crests will be 150 feet wide with side slopes of 1 on 10 extending to the riverbed. New levees will be built by Western along these embankments reaching about 18 feet above the river surface, 30 feet wide on top.

Dredge fill work on the Western contract is estimated at 335,600 cubic

Cat D9 dozer levels spoil pile formed by Manitowoc 4500 digging pilot canal.

yards, and levee work calls for 219,900 of earth from nearby borrow pits. The dredge fill and new levees will be protected by stone fill pile revetments being built by Cunningham-Kiewit.

To control the water level in the future lake, inlet and outlet structures are being built on a subcontract by Goberson & Smith Co., Cedar Rapids, Iowa.

When the upstream plug of the pilot canal is removed, many millions of yards of material including spoil piles from the pilot canal and revetment excavations will be carried downstream by the current. The sand and silt will not be deposited along the way where it could impede navigation because the Corps of Engineers program of channel stabilization has given the Missouri a stable channel that is kept clean and deep by the hydraulic force of the current alone.

The cutting power of the river in its new channel will be contained by the trench toe revetment being built along the eastern bank, the outer edge of the arc. Here Luhr and Midwest are cutting a trench along the planned left bank of the river and laying tons of stone to protect the bank from future erosion.

The trench toe revetment, a device now common on the Missouri, is 13,439 feet long and calls for a half-million yards of excavation and 165,000 tons of stone fill. To open the 24-ft. deep trench, Luhr-Midwest is using a Bucyrus-Monighan 5-W walking dragline carrying a 6-yd. Hendrix perforated bucket on a 120-ft. boom. A Caterpillar D386 diesel powers the machine.

The walker cuts a trench 16 feet wide at the bottom and about 10 feet below the average low water level of the river. Width at the top varies from 80 to 90 feet. Excavation work is closely coordinated to the stone laying. Luhr-Midwest superintendent George Ray noted that if the dragline worked too far ahead of the stone laying operation, the newly cut bank would not stand.

Depends on Weather

Rate of progress in the stone hauling operation is dependent on the weather. Stone is hauled from a quarry about six miles distant, over former farm roads which turn to jelly in a heavy rain. A lone Adams 550 grader blades the roads into shape.

Ray schedules the work so that his night shift can make an initial cut about 14 feet deep and almost the full width of the trench. Then the dragline walks back to where the stone laying activity will begin during the day shift. The daytime operator makes the final cut just ahead of the stone dumping fleet.

Ramps in the big trench are cut by D6 dozers so the fleet of about 10 trucks can dump the stone at the proper level. Final cuts on the revetment side of the trench are made by a Northwest model 25 dragline powered by a Murphy diesel and carrying a ¾-yd. Owen bucket. When the upper bank is finished to the proper slope (one on three), a Gradall places a layer of stone on it and evens the stone over the whole bank to the proper thickness. The telescoping excavator is powered by a General Motors diesel.

The hauling fleet, mostly Whites with 12-ton dump bodies, can dump 1,000 tons of the stone in a 12-hour day. Ray asserted that the DeSoto job is no test of the walker's ability because the machine can easily keep ahead of the stone laying phase of the job. Length of the dragline's working shift was often trimmed to prevent getting too far ahead.

Ray recalled that the Bucyrus-Monighan is a veteran of several Missouri river jobs, some of them much more demanding on machine capacity. When *Excavating Engineer* visited DeSoto Bend, the revetment work was 20% ahead of schedule.

All stone for the DeSoto Cut-off revetment comes from a quarry carved in the side of a nearby bluff that overlooks the entire project. It is designated simply "Quarry No. 5" by its owner, City-Wide Rock & Excavating Co., of Omaha. Pit superintendent is Don McGinnis.

On the pit floor, about 80 feet below the entrance, two Gardner-Denver drills sink 2½-in. blast holes in varying depths and patterns. Two 1½-yd. shovels, a Bucyrus-Erie 38-B and a Northwest 6, were stripping one of the intermittent layers of shale overburden while a Northwest 25 loaded out shot limestone into the Whites. Hauling overburden were two Euclid rock trucks and two Cat DW21 scrapers.

Clean-up units on the pit floor include a Cat D7 and an International TD-24. A Bucyrus-Erie 22-B served as a spare shovel for either stripping or loading.

Corps specifications call for stone weighing not more than 250 pounds per piece and with less than 5% fines. Well planned shots brought down the limestone in the proper size limits and occasional oversize pieces were rejected by shovel selection.

City-Wide provides both the stone and the hauling units for the Luhr-Midwest trench toe work.

Levee work on the Luhr-Midwest contract was subbed to Wurtle & Barrett Co., Nebraska City, Neb.

District Engineer for the Omaha Corps district is Col. D. G. Hammond. Area engineer at the DeSoto Cut-off project is Ralph Fitzhugh; chief inspector is Allan McClanahan.

Stone fill for DeSoto Bend job comes from this nearby quarry where Northwest model 6 and Bucyrus-Erie 38-B are shown stripping a layer of shale overburden.

Something for the Birds

Need for a refuge in the Omaha area was apparent for many years to conservation men, but wetlands suitable for migratory waterfowl were not readily available. The DeSoto Refuge will be another link in a chain of federal wildlife refuges that provide resting, feeding and sanctuary areas for flocks of ducks and geese moving through the country.

The game sanctuary will permit a more natural fall migration and a healthier condition for the flock, according to Bureau of Sport Fisheries and Wildlife officials.

"It will provide public hunting opportunities now lacking in the area and afford hunters in Iowa and Nebraska a chance to harvest a reasonable number of Canada geese and other waterfowl," noted Howard S. Huenecke, assistant regional supervisor of the bureau's Branch of Wildlife Refuges.

Huenecke added, "DeSoto Refuge will also provide a feeding and resting area for the tremendous numbers of snow and blue geese that migrate northward through this area in the spring." The spring concentrations of as many as 300,000 to 400,000 northbound geese occasionally damage farm crops and are an annual threat.

Food for the waterfowl is to be produced on the farm lands within the refuge and some will be available for the spring migrants. This may help forestall crop damage on private lands.

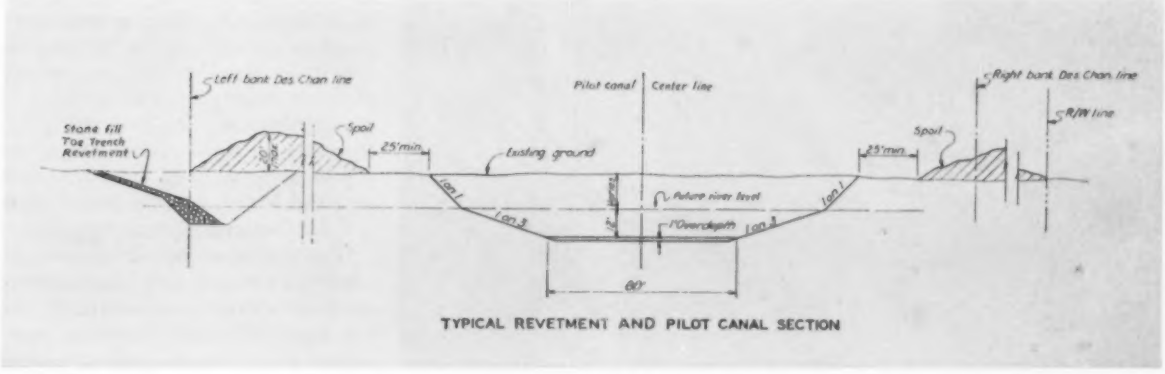
In addition to its use by waterfowl, the DeSoto National Wildlife Refuge will provide a suitable habitat for upland game birds, deer and small animals. State commissions of Iowa and Nebraska will coordinate their hunting regulations in the surrounding areas to permit game populations of the refuge to reach a suitable density. Then choice hunting will be available on the refuge around the new island. The island itself will probably be "off-limits" to hunters.

The National Park Service is cooperating with the Bureau of Sport Fisheries and Wildlife in laying the groundwork for recreational uses of the refuge which will consist chiefly of daytime facilities for nearby residents rather than overnight or extended use facilities for tourists.

Plans include accommodations for swimming, water sports, boating, fishing and picnicking. The area will be open to the public from about May 1 to Oct. 1—the birds will have priority the rest of the year.

Farm land in the refuge will be worked on shares by local farmers with former owners and tenants getting first chance to use the land. The government's share of each crop will be left in the fields to feed the transient waterfowl and other game.

(Above) Superintendent Jim Nutt stands on crawler tread to talk to operator.



TYPICAL REVETMENT AND PILOT CANAL SECTION

When the Missouri river enters the pilot canal it will cut new banks to the design channel lines shown carrying away most of the spoil. The revetment on the outer side of the curved channel will stop the river's cutting action on that side.

Majestic's Mile-a-Day Pipeline

Wabash River country job hits fast pace despite water troubles and caving banks.

WHEN Majestic Contractors International Ltd., of Toronto, Ont., built a 52-mile leg of natural gas pipeline from Wheatland, Ind. to the Wabash River, the sequence of operation on the Canadian outfit's project seemed to come right out of a pipeline textbook.

Majestic's contract is part of the 30-in. line that will stretch 352 miles from Portland, Tenn., to Joliet, Ill. The firm started work last summer and finished up in 55 days, despite water problems. The job was done for Midwestern Gas. Co., Houston, Tex.

According to Superintendent Richard Leonard, the only difficulty on the project was water—all kinds and from everywhere. Many springs were encountered and considerable rain hit the job, causing cave-ins and water-filled trenches.

But, Leonard adds, the water failed to put the job behind schedule. Seven Bucyrus-Erie 22-B hoes and clams promptly cleared the cave-ins, and water pumps and concrete weights mastered the inundations.

A Cat MD7 strings a 40-ft. section of 30-in. pipe. The 48-in. wide trench was dug by a trencher until wet spot in foreground was encountered. Hoes and clams then took over.

Here's an example of the excavation problems where the pipeline crosses a wet gully. A ¾-yd. clamshell cleans out the mucky cave-ins before the lowering-in begins.

A brush gang and a Caterpillar D6 tractor spearheaded Majestic's work on the 75-ft. right-of-way. The D6 knocked down trees and stacked brush for burning.

The brush gang was followed by six D7's and a D8, all equipped with bulldozer blades. These machines prepared the right-of-way for the stringer, Joe Willet Co., Monroe, La., which used two sidebooms, a Cat MD7 and an International TD-18, to string 40-ft. joints of A. O. Smith and Consolidated Steel pipe. Bending was accomplished by two D7 tractors and a Cinch bending machine.

The pipe gang placed the stringer bead and hot pass with Lincoln welders mounted on two D7 tractors. Altogether, 19 welding machines were on the firing line and four at tie-ins.

Two Cleveland ditchers, three Bucyrus-Erie 22-B's and one Cat D6

Nineteen Lincoln welders were used on the firing line of Majestic's 52-mile section from the Wabash River to Wheatland, Ind.

handled ditching operations. The ditch was 48 inches wide with a 30-in. cover in open country, 4-ft. cover under highways and 4 to 6-ft. cover under four small creeks.

The following spread made up the dope gang: two Cat No. 583 pipelayers, one No. 572, one Allis-Chalmers HD-19, a CRC dope machine, a CRC cleaning machine and five CRC dope pots.

Most of the pipe was .375 inches thick, with heavier .675 inch pipe under highways and creeks. Barrett enamel and a fiberglass wrapping were used to coat the pipe, all of which was X-rayed.

Lowering-in Gangs

Two lowering-in gangs worked on Majestic's job, using two No. 572 pipelayers, two Allis-Chalmers HD-19's, two Cat MD7's with sidebooms, a D7 dozer and two 22-B hoes. A Cleveland backfiller handled backfilling while three D7's and a No. 12 motor grader cleaned up. The 572's were also used to place 6,000-lb. concrete weights on the pipe to hold it under water in creek beds.

Gate valves were placed every 15 miles along the line. No pumping stations have been constructed yet, but one is proposed five miles southwest of Prairie Town, Ind., according to George Lott, Midwestern Gas Co.'s inspector on the job.

Other key personnel on the project, besides Lott and Leonard, were these foremen: tie-in, Bill Hayden; dope, R. G. Mott and Tom Hayden; welding, Bill Nelson; and ditching, Whitey Lewis.

(Above) As Cat No. 572 pipelayer in foreground suspends pipe which has been welded and cleaned, a No. 583 with a CRC doping machine applies coating and wrapping. Pipelayers in background have just lowered-in. (Below) A backfiller covers the line.

Ex-Laffs Rides the Big Wheel

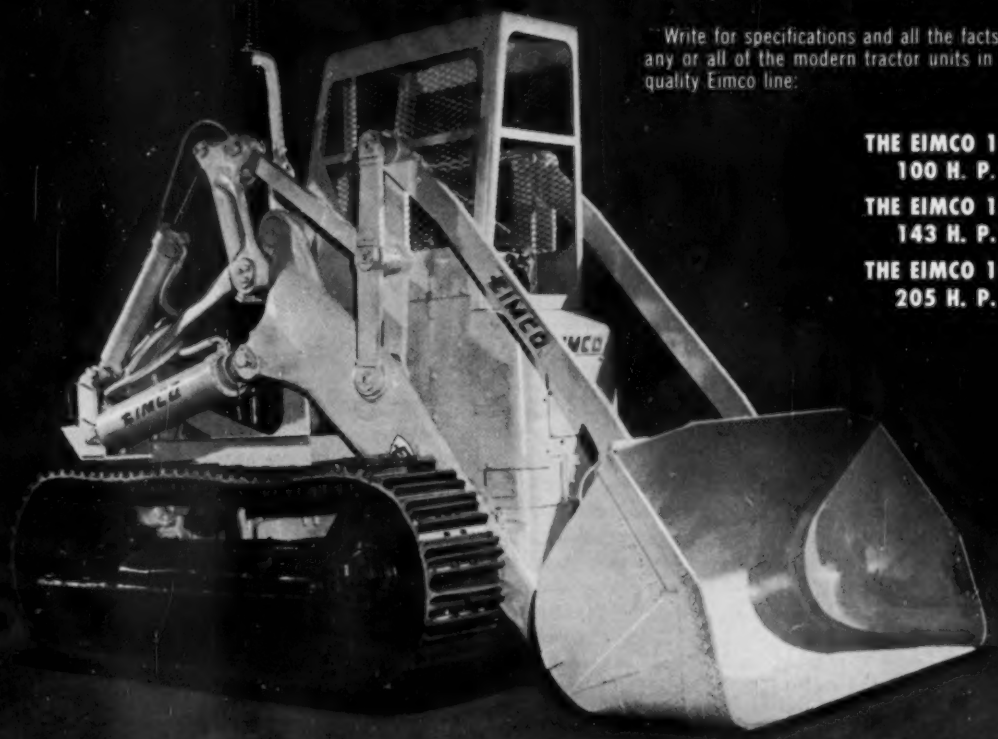
By Marvin Townsend

"IF YOU'RE GOING TO QUIT, CHESTER, IT SEEMS TO ME YOU PICKED AN ODD TIME AND PLACE TO TELL ME ABOUT IT!"
"OH, OH! THE BOSS IS SURE GONNA' BE HARD TO GET ALONG WITH TODAY."

SUNNYBROOK
NUDIST CAMP
CONSTRUCTION CO. INC.
SEWER - ROAD CONSTRUCTION
"SOMEONE HAS BEEN TEASING THE BOSS ABOUT THE SIZE OF HIS HIPS."
"WE GOT THE CONTRACT - BUT WITH ONE STIPULATION."

EXCAVATING ENGINEER
LOCAL No. 5
"WHAT'D I TELL YOU? HERE THEY COME."
"WHAT A TOUGH FOREMAN! HE WOULDN'T EVEN GIVE ME A CHANCE TO EXPLAIN I DON'T WORK HERE."

You're Years Ahead with an Eimco! This is a crawler-tractor born of over seventy-five years experience in the designing, engineering and production of heavy-duty industrial machinery. It is the first really modern tractor, based on engineering and production standards not restricted by what has been done before. Engineers admire its excellence of design. Contractors and operators appreciate its "finger-tip" controlled performance and unsurpassed low maintenance costs. It incorporates more important "firsts" than any tractor you can buy today. It is truly quality-built. It is fully guaranteed for one full year of single shift service. It is the first modern line of tractors. THE EIMCO LINE.



Write for specifications and all the facts on any or all of the modern tractor units in the quality Eimco line:

THE EIMCO 103
100 H. P.

THE EIMCO 105
143 H. P.

THE EIMCO 106
205 H. P.

EIMCO

Tractors • Dozers • Excavators • Front End Loaders • Log Loaders
Special Steel Mill Excavators and Front End Loaders

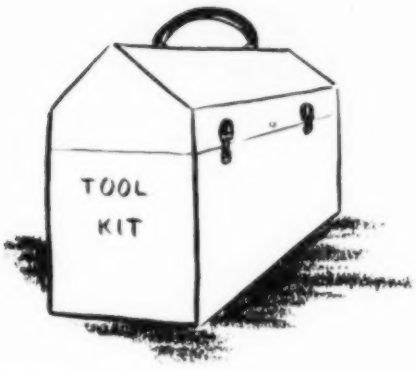
"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1884"

THE EIMCO CORPORATION

EXPORT OFFICE: 51 - 52 SOUTH STREET, NEW YORK, N. Y. B-518
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

TRACTOR LOADER DIVISION
634 SOUTH 4TH WEST
SALT LAKE CITY, UTAH — U.S.A.

Why Crankshafts Fail . . . external causes are usually responsible



by W. E. Irwin

Manager, Service Dept.
Caterpillar Tractor Co. Industrial Engine Plant, Peoria, Ill.

WHEN a major mechanical failure occurs to an engine, it is a natural reaction for the owner to blame the manufacturer. Company representatives, investigating such failures, are often met with such remarks as, "Your engine broke a crankshaft and ruined our torque converter," or "Your engine has failed and we expect you to give us a new engine, or at least a new crankshaft and cylinder block."

Although engine builders often recompense owners for engine damage resulting from crankshafts and other engine components that fail because of "defects in materials or workmanship," facts accumulated over the years prove that the odds are heavily in favor of crankshaft failures being caused by some external force or condition.

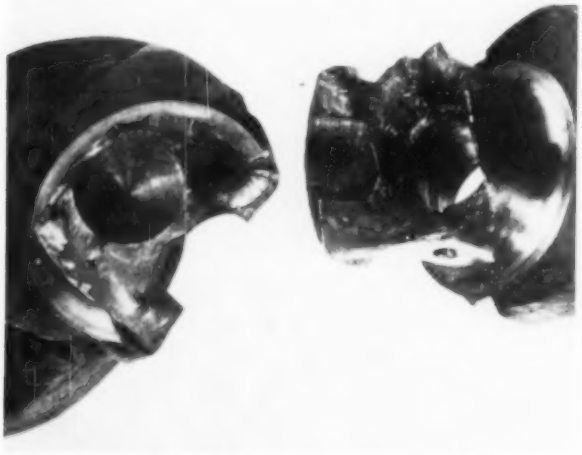
No matter who builds the engine, crankshafts and bearings are not designed to withstand the extreme stresses that can be exerted on them when various types of power take-offs are misaligned, improperly positioned endwise or so designed that they can exert abnormal forces on the crankshaft.

Bearing Failure

Recently a relatively new engine on a drilling rig experienced a severe seizure of the rear main bearing which ruined the crankshaft, as well as the cylinder block, causing damage amounting to nearly $10,000. The engine was driving directly into an air clutch, and an on-the-job check revealed the inner drum of the clutch was extremely misaligned in relation to the outer drive ring. The extreme side loads exerted on this engine's flywheel and crankshaft caused the rear main bearing to seize the full length of its bore, generating so much heat that both the crankshaft forging and cylinder block casting cracked beyond repair.

Alignment of air clutches is critical. The higher the air pressure in the boot, the closer the alignment must be to keep the side loads within safe limits. Misaligned air clutches can cause failure to any member to which they are fastened, be it a diesel engine, a torque converter, compound, pump or some other attachment.

In another case, several diesel engines powering torque converter equipped excavators experienced rear main (thrust) bearing failures. The front thrust flange of the rear main



(Left) Torsional vibration fractures are characterized by a break at a 45° angle, usually toward the rear of the engine. A vibration dampener can help prevent such failure. (Right) Improper shimming (described in text on the next page) caused this crankshaft failure. The crankshaft broke, as shown in this photo, the cylinder block cracked and the rear faces of all the main bearing caps and supports in the block were gouged because of a great forward thrust on the crankshaft.

bearing became badly scored and, in some cases, broke off. It was found that the power train design allowed the torque converter to exert a linear pull on the crankshaft with thousands

High bending-type loads on a crankshaft usually result in a break which starts in the fillet at the main bearing journal.

of pounds of force under full load conditions. The design was changed by the excavator manufacturer to include a thrust bearing to absorb the pull of the torque converter. And the solid connection of the torque converter shaft to the flywheel was redesigned with the result that bearing and crankshaft failures were eliminated.

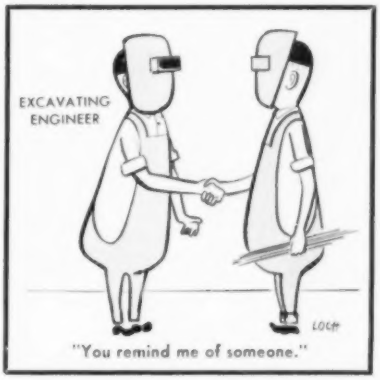
Coupling Fault

Improper shimming caused several thousands of dollars damage to another new engine on a drilling rig. In this case, the engine was driving through a coupling into a torque converter, and the torque converter was driving into an air clutch. The coupling between the engine and the torque converter was not properly shimmed to allow the crankshaft to float. Instead, the crankshaft was pushed forward with great force.

The result was that the rear flange of the rear main bearing was broken off completely. The engine was run to destruction as the crankshaft broke through the web adjacent to the rear main bearing. The cylinder block was cracked through the rear bearing web, and the rear faces of all the main bearing caps and supports in the block were severely gouged because of the great forward thrust put on the crankshaft.

It was also found that the air clutch, fastened to the output shaft of the torque converter, was grossly misaligned which, in all probability, was responsible for complete failure of the torque converter.

Various physical and metallurgical analyses can be employed to determine if a particular crankshaft failure was caused by manufacturing defects. The type of failure also tells a lot about the cause and gives clues helpful to correcting the problem and preventing recurring failures.



"You remind me of someone."

Here are some typical causes of crankshaft failures:

1. Side loads on the crankshaft can break down the oil film in the bearing, causing seizure. High end loads on the crankshaft not only can score the thrust surfaces of the bearings, but can generate enough heat to reduce the bearing clearance to the point of seizure. Continued running will usually result in a jagged, complete crankshaft fracture near the fillet.

2. High bending type loads, usually from misalignment of driven machinery, can start a crack in the fillet at the main bearing journal which progresess through the web to the adjacent rod bearing journal.

3. Torsional vibration normally fractures a crankshaft at a 45 degree angle. The wide use of torsional vibration dampers keeps this type of failure to a minimum. However, the damper can become overloaded because of added driven equipment or the damper can become damaged. Overspeeding may introduce additional torsional vibrations that can be damaging.

FOR 50 YEARS...
Finest in the Field!
Rely on the bucket contractors rely on. The Omaha Dragline Bucket gives full load with every cast. Perfect balance makes it easy to spot dump. Alloy steel cutting teeth stay sharp, tough and ready.
Strike pay dirt now!
Complete information and specifications await your letter.
DRAKE-WILLIAMS MOUNT
• OMAHA, NEBR.
OMAHA
DRAGLINE BUCKETS

News from the Field

Illinois SAE Group Meets

The central Illinois section of the Society of Automotive Engineers will hold its 11th Annual Earthmoving Industry Conference April 5-6 in Peoria, Ill. Headquarters will be at the Pere Marquette hotel.

It is expected that between 1,500 and 2,000 SAE members and guests involved in construction work and in the design and manufacture of equipment will attend the technical sessions.

Highlights of topics on the program include *Needs of the Corps of Engineers in Earthmoving Machinery*, by Lt. Gen. E. C. Itschner, chief of the U.S. Army Engineers; *Use of Turbines in Earthmovers*, by W. J. Lux, research department, Caterpillar Tractor Co.; and *Earthmoving Equipment Requirements for the Next Decade*, by a panel of prominent contractors.

Army Orders 180 Crawlers

A $3,196,654 contract for 180 International TD-20 crawler tractors has been awarded to International Harvester by the U. S. Army Corps of Engineers. The 134-hp units will be built in the company's Chicago tractor works.

Each of the crawlers—second largest of their type manufactured by Harvester—will be equipped with International cable-control bullgrader blades and front cable controls. Specifications call for each unit to be equipped with five floodlights and one headlight. Electrical equipment will be radio interference suppressed and fungus-proof.

AMC Announces Coal Show Plans

Top industry and government officials will be among the 3,000 persons expected to attend the three-day 1960 coal convention of the American Mining Congress May 9-11 in Pittsburgh, Pa. Raymond E. Salvati, president of the AMC and president of Island Creek Coal Co., Huntington, W. Va., will preside.

The opening session of the convention will feature a forum on *National Fuels Policy*, according to R. H. Hughes, national program committee chairman and president, Clinchfield Coal Co., Dante, Va.

Participants in the opening session include: Rep. Wayne N. Aspinall (Dem., Colo.), chairman of the House Interior Committee; Sen. Frank E. Moss (Dem., Utah) of the Senate Interior Committee; Rep. John P. Saylor (Rep., Pa.), ranking minority member of the House Interior Committee; Dr. Frank K. Pittman, director, division of reactor development, Atomic Energy Commission, Washington, D. C.; and R. A. Kampmeier, assistant manager of power, Tennessee Valley Authority, Knoxville, Tenn. A representative of the Department of Interior is also expected to participate.

Richard Harkness, NBC news analyst, will speak on *Behind the Scenes in Washington* at a special luncheon Tuesday, May 10.

AMC's coal convention is the only meeting of the coal industry each year where mining officials, operating personnel and equipment manufacturers exchange ideas about mining methods and equipment. Subjects to be discussed at 10 technical sessions include the latest improvements in underground and strip mining, coal preparation, mine safety, mine haulage and continuous mining.

Also on the program will be an all-day tax forum on Wednesday, May 11. On the following day, post-convention field trips have been arranged for mining men. One group will in-

Continued on page 54

ONE TON FOR 6 CENTS...Total Digging and Hauling Cost with a Sauerman

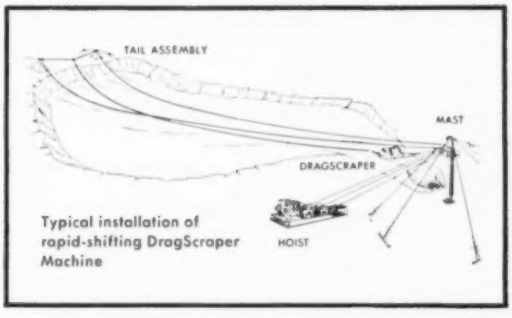
Dig and haul from your high bank, deep pit or underwater deposit direct to plant hopper or stockpile for 6 cents per ton. This cost is based on current job figures for Sauerman DragScrapers operating over average depth and haul distances.

The reason: one man and one machine handle the entire job. You save money three ways over multiple machine methods. Your power costs are much lower. A single operator replaces two or more on your payroll. Your maintenance costs are much lower because only the DragScraper Bucket and cable contact the material handled.

If you are hauling over distances up to 800 ft. or digging under water at depths to 100 ft.—the Sauerman DragScraper Machine is the most economical means you can use.

You can get DragScraper Machines in sizes from ⅛ to 15 yds. to match your tonnage requirements. Write or call about the physical dimensions of your deposit. We'll recommend the proper machine. For general information and detailed data on specific installations request Catalogs A and SG-1.

Plant Operators Are Saving On Power, Labor And Maintenance With Sauerman DragScraper Machines



Typical installation of rapid-shifting DragScraper Machine

DragScraper Bucket deposits load of sand onto grizzly hopper.

SAUERMAN BROS., INC.

622 So. 28th Ave., Bellwood, Illinois
LInden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent DragScrapers • Slackline and Tautline Cableways • Durolite Blocks

Award winners are George M. Drake (left) and William Denny (right). Abel Wolman (center) is shaking hands with Mansell L. MacLean, while Philip Grove looks on.

News . . .

Continued from page 52

spect the operations of Hanna Coal Co. in eastern Ohio, and a second group will visit the Maple Creek preparation plant of the U. S. Steel Corp. near Pittsburgh.

Round-the-Clock Operations Planned at Panama Canal

Modern fluorescent lighting is being installed to ease the nighttime traffic jam at the three Panama Canal locks.

Commercial shippers will realize considerable savings with round-the-clock operation. Presently, the locks are closed from dusk to dawn. Ships caught at the canal entrance in late afternoon must wait until the following day to start their passage. This means the ship is inoperative for a 12-hour period, during which operating expenses continue.

General Electric will supply lighting fixtures for Earl M. Fruend Co., Panama, electrical contractor for the installation. The 1,300 flourescent luminaires are part of a $500,000 contract which includes transformers and wiring.

About 750 6-ft. two-lamp units—normally used for street lighting—will be installed atop the walls of the locks, lighting the area at the water's edge where electric "mules" pull ships through the locks. The luminaires will be mounted on 20-ft. aluminum poles, hinged at the base so they will swing down and away from the lock's walls when extra-wide ships pass through the canal.

According to General Electric engineers, the locks will be as bright as a well-illuminated downtown traffic street.

In addition to the 750 units installed at the edge of the locks, some 500 fluorescent fixtures—similar to those used in traffic tunnels—will be installed on the sides of the locks themselves, illuminating the wall to indicate clearance for the ship's pilot. Another 50 fluorescent floodlighting fixtures will illuminate the control houses.

The lighting installation is scheduled for completion in the next few weeks, at which time 24-hour operation of the canal's three locks—Pedro Miguel, Miraflores and Gatun—will begin.

An over-all expansion plan has been undertaken by the Panama Canal Co. recently. The channel in the southern portion of the Gaillard Cut has been widened from 300 to 500 feet. The canal's usage increased from 6,000 ships a year before the war to about 10,000 ships in 1959.

Diesel Engine Tips

A new 24-page booklet on diesel engine maintenance is offered by Cummins Engine Co., Inc., Columbus, Ind.

Entitled *Ten Maintenance Steps*, it tells power users how to increase equipment availability, reduce operating costs and obtain better engine performance.

The simple, easy-to-read text covers such topics as keeping dirt out of the engine; regulating fuel supply; control of operating temperatures; and protection against corrosion.

Present Moles Awards

Winners of the 1960 Moles Awards were honored at the 20th annual Moles banquet January 27 in New York City's Waldorf-Astoria hotel. More than 1,000 heavy-construction industry men attended.

A non-member award was made to George M. Drake, president of Johnson, Drake & Piper, Minneapolis, Minn. William Denny, vice president in charge of the construction division of Merritt-Chapman & Scott Corp., New York, received the member award.

Main speaker at the event was Abel Wolman, professor of engineering at John Hopkins university. Presiding was Mansell L. MacLean, president of the Moles and president of MacLean-Grove & Co. Philip Grove was chairman of the awards committee.

Construction Men Honored

Outstanding men and companies in the construction world were honored recently at the eighth annual America's Builders Recognition Night at Pepperdine College, Los Angeles, Calif.

An honorary doctor of laws degree was conferred on Claude Cummins, board chairman of Standard Dredging Co., New York, N. Y. Cummins was honored for his long dredging career, which has covered six decades.

Companies admitted to the Hall of America's Builders at the event are: J. L. Simmons Co., Chicago, Ill.; Mason & Hanger-Silas Mason Co., New York; Guy F. Atkinson Co., South San Francisco, Calif.; Fruin-Colnon Contracting Co., St. Louis, Mo.; Gilbane Building Co., Provi-

Continued on page 56

Nearly 700 acres in this pit

. . . but fast LW tractor works every "corner" of it

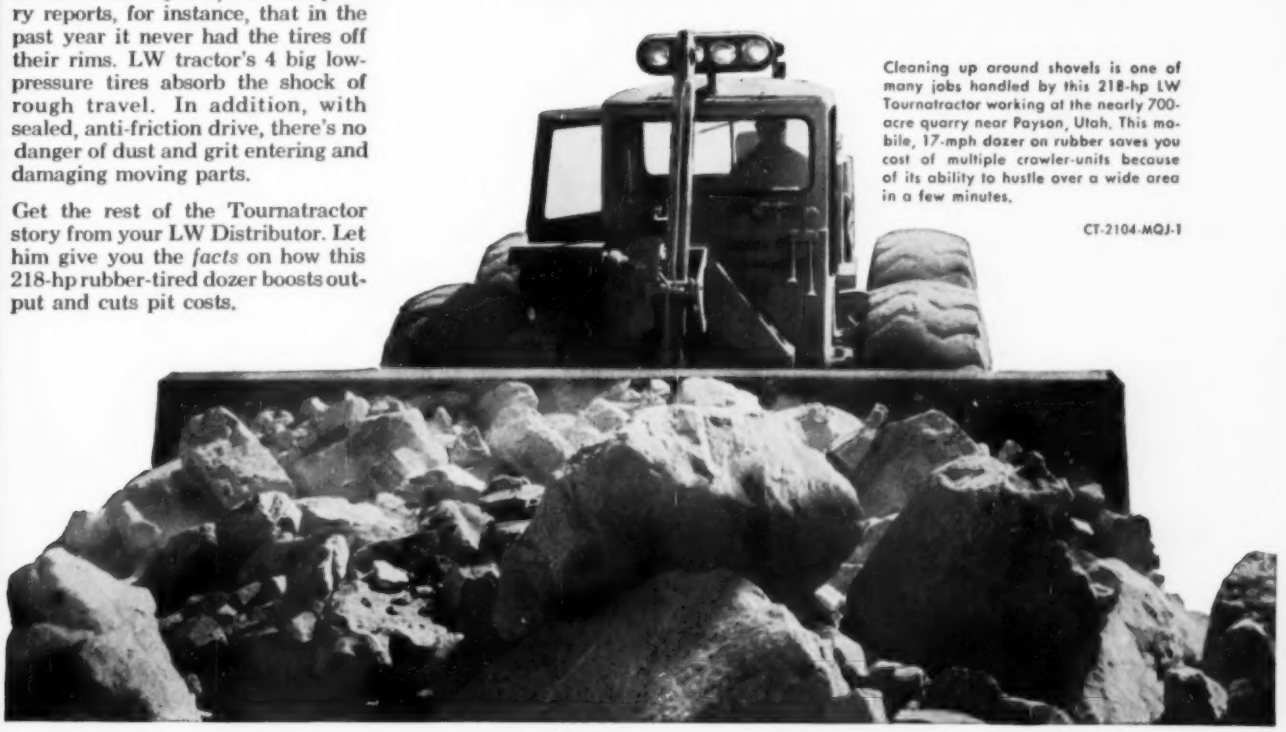
At the Keigley Quarry, Payson, Utah, about 700,000 tons of limestone and dolomite are produced per year. On this nearly 700-acre site — owned by the Columbia-Geneva Steel Division of United States Steel Corporation—a LW Tournatractor® handles a wide variety of jobs. This LeTourneau-Westinghouse rubber-tired dozer cleans up around shovels, maintains stockpiles, sometimes strips overburden, pushes railcars, tows compressors . . . and maintains 10 miles of roads!

Travels up to 30 mi per day

One of the main reasons this single Tournatractor can handle *all* these jobs for Keigley Quarry, is its ability to *run* from one assignment to the next. There's no time lost "crawling" between locations. During a normal work day at the big quarry, this 17-mph LW tractor travels a total of 25 to 30 miles.

Maintenance costs for Tournatractor are relatively low, too. The quarry reports, for instance, that in the past year it never had the tires off their rims. LW tractor's 4 big low-pressure tires absorb the shock of rough travel. In addition, with sealed, anti-friction drive, there's no danger of dust and grit entering and damaging moving parts.

Get the rest of the Tournatractor story from your LW Distributor. Let him give you the *facts* on how this 218-hp rubber-tired dozer boosts output and cuts pit costs.



Cleaning up around shovels is one of many jobs handled by this 218-hp LW Tournatractor working at the nearly 700-acre quarry near Payson, Utah. This mobile, 17-mph dozer on rubber saves you cost of multiple crawler-units because of its ability to hustle over a wide area in a few minutes.

CT-2104-MQJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

News . . .

Continued from page 54

dence, R. I.; McNeil Construction Co., Los Angeles; Lindgren & Swinerton, Inc., Los Angeles; Sullivan, Long & Hagerty, Bessemer, Ala.; D. C. Bass & Sons Construction Co., Enid, Okla.

Also honored were the Ralph M. Parsons Co., Los Angeles, for its work in the field of engineering construction; Merritt-Chapman & Scott Corp., New York, on its 100th anniversary; and Douglas Aircraft Co., Santa Monica, Calif., for leadership in aeronautics.

A personal award for individual attainment went to Roy Price, chairman of Engineers Limited Pipeline Co., San Francisco.

Highway Department Gets Radio System

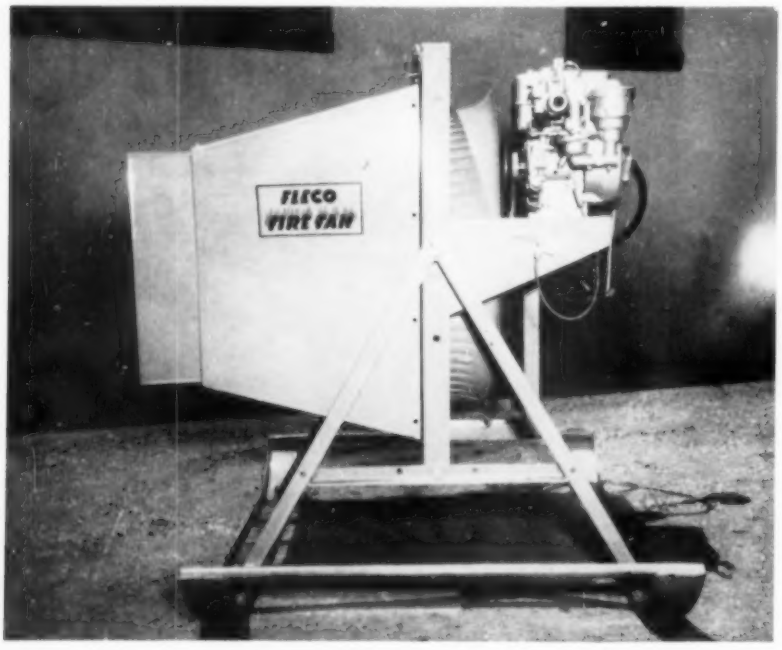
Alabama's state highway department has contracted with General Electric's communication products department for 275 mobile radios—one of the largest highway maintenance communications systems in the nation—as a means of speeding the state's $500 million road-building program.

In addition to the mobile unit for cars and trucks, the system will include 48 General Electric base stations. These will be installed at the highway department's Montgomery headquarters, seven division offices, and various highway camps and district offices throughout the state.

According to State Highway Director Sam Englehardt, the mobile units will be used in vehicles operated by the key personnel responsible for more than one operation or road job. With radio, engineers and supervisors will be available within seconds. In the past, it took numerous telephone calls and long delays to reach them.

EXCAVATING ENGINEER

"I'm getting outta this chicken outfit . . ."



Brush-Burning Fan

A unique new piece of equipment for land clearing, called the Fleco Fire Fan, forces fast, complete burning of brush, stumps and debris in piles or windrows. Even when wet, materials can be set aflame and forced to burn quickly and economically.

The Fleco model FFP is powered by a 3-hp Briggs & Stratton air-cooled engine which turns a 24-in. six-blade fan, producing an air velocity up to 32 mph. The fan is rated at 12,000 cfm. Adjustable vents permit the full flow of air to be directed to a specific area.

A self-priming pump sprays fuel oil onto the pile in a carefully controlled flow for additional burning efficiency. A nozzle and 21 feet of hose are supplied to insure safe placement of the fuel supply. A single throttle-and-spray valve simplifies operation.

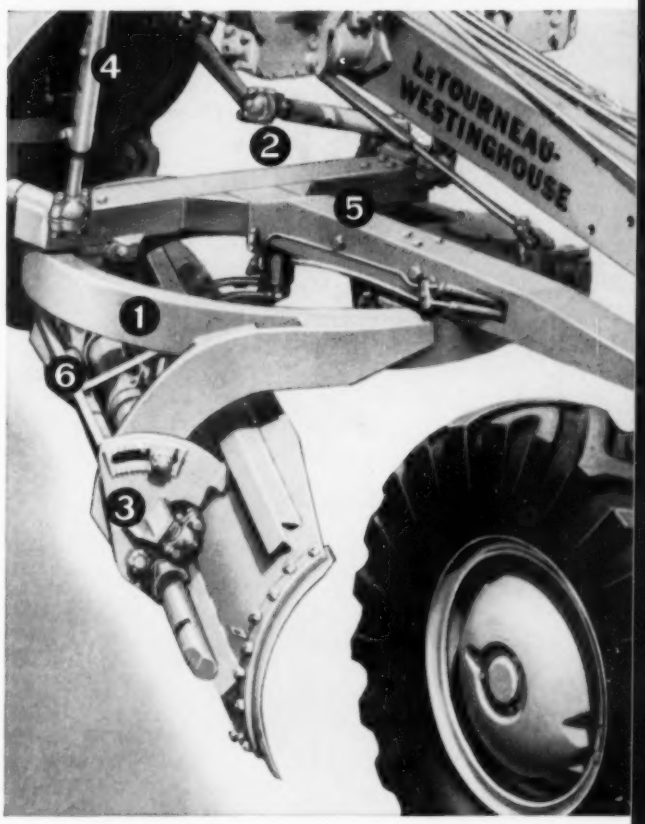
Skid-mounted, the fan can be easily hauled or towed from pile to pile and can be mounted on a truck or jeep for greater maneuverability to facilitate servicing of many piles.

The fan eliminates the need for dangerous soaking of piles with highly-combustible liquids, yet gives thorough burning in fewer man-hours.

The unit is made by the Fleco Corp., P. O. Box 2370, Jacksonville, Fla.

LW graders give you **positive blade control** for

...fast movement, lasting accuracy, long life



The "working end" of your grader is the blade and the circle assembly that controls it. With LeTourneau-Westinghouse graders, you're set up with a system that assures you *fast* blade movement with *positive* control. Result: Your operator grades more accurately, cuts deeper, pushes more dirt faster than any similar unit. Here's why:

1 BIG 63" CIRCLE... none bigger in the industry... all-welded and precision-machined, top, bottom, and inside, turns smoothly within adjustable guides. Teeth are protected from abrasive materials.

2 ENCLOSED GEAR-DRIVEN LATERAL SHIFT... free from lost motion and vibration common with open-rack types, and provides rigid support to blade in all positions.

3 QUICK, EASY MOLDBOARD TILT-ADJUSTMENT... to change pitch of moldboard, operator loosens only one nut on each circle leg and makes desired adjustment.

4 WIDE-SPACED LIFT-LINKS...go "straight down" for stable blade control... strong, telescopic, they extend or retract easily, have wear-compensating shim adjustments, and enclosed ball-and-socket connections. Short, stocky lift-arms avoid springing action for greater rigidity.

5 RUGGED T-SHAPED DRAWBAR... offers immense strength for circle support and blade pull. "T" design permits excellent blade visibility. Drawbar has 3 adjustable circle-wearing plates.

6 UNIVERSAL MOUNTING FITS ALL MOLDBOARDS...bracket, slide-shift, or power-shift moldboards can be interchanged on the *same* circle and legs.

Positive blade control is just one of the many profit-building features on the new, better-than-ever LW graders. Come in and get the complete facts. 7 models 67 to 190 hp.

G-2157-G-1

LW **LeTOURNEAU-WESTINGHOUSE COMPANY,** PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Cat crawler-drawn short work of mean

Scrapers make mountain hauls

A canal across a mountain! That's the job this contractor's doing in Colorado. Brannon Construction Co. is building an irrigation canal from Vega Dam near Collbran to agricultural areas 18 miles away. To make the mountain job even tougher the canal path is mostly rock. Hauls are short—1000 feet maximum. There's little room for turning.

Brannon Construction got set for the job with a spread of three Caterpillar D8 Tractors, two No. 90 Scrapers, a D9 and a D7. A Cat No. 12 Motor Grader—used for sloping the canal sides—completes the spread.

Each D8 pulls a No. 90 Scraper, while the D9 backs them up with its mighty pushloading force. The D7 dozes and pulls a sheeps-foot roller. This efficient spread moves about 4500 yards a day. Even with tricky mountain maneuvering, scrapers make 5 to 6 minute cycles.

This application is another demonstration of the efficiency of crawler-drawn scrapers—on the short hauls, for the rough ground and underfoot conditions that are mean and tricky.

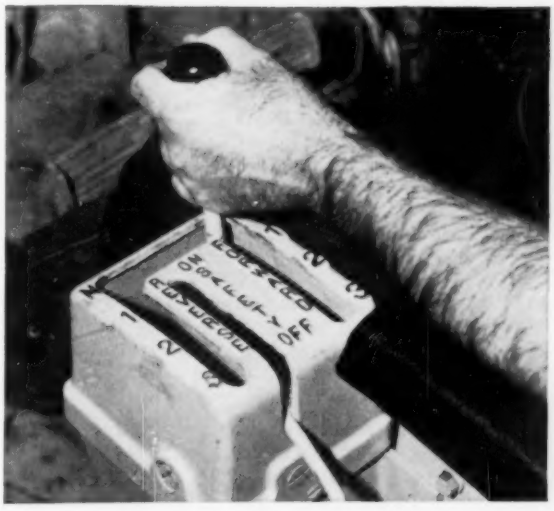
This is exactly the kind of going that Cat crawler-scraper combinations can convert to high production. They're self-loading or, for even higher production, they can be pushloaded. And with the added brawn of recent improvements, Cat crawler-drawn Scrapers haul bigger loads, last longer. Your Caterpillar Dealer has four-wheel Scrapers to match the D9, D8, D7 and D6 Tractors and to fit different hauling needs. And he has the tractors to match any job that comes your way! New 335 HP D9 Series E . . . the new D8 Series H—up 44 HP to 235 . . . the 140 HP D7 Series D. See your Cat Dealer for the quality equipment . . . before you bid on your next tough job.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BORN OF RESEARCH
PROVED IN THE FIELD



POWER SHIFT TRANSMISSION MAKES THE D8 AND D9 EVEN MORE NIMBLE

Shift on-the-go under full load in a split second. No more clutching. Shift in a single motion with a flick of the selector lever. Even when conditions are as tough as those above, operators will move more dirt with the new Cat power shift transmission.

Equipment You Ought to Know About

2-Yd. Wheel Loader

Manufacturer: Caterpillar Tractor Co., Department EE, Peoria, Ill.

Claims: Introduction this month of a rubber-tired Traxcavator marks Caterpillar's entry into the wheeled front-end loader field. The new No. 944 Traxcavator is the first model of an all-new product line. It is fitted with a 2-yd. bucket as standard equipment.

A company spokesman said marketing of the No. 944 culminates several years of research, engineering and field testing.

Two other wheeled Traxcavators—one larger and the other smaller than the No. 944—will go into production in a few months.

Most apparent feature of the new loader is the location of all lift arms and hydraulic cylinders ahead of the operator's compartment. The benefits are unobstructed vision for the operator and an extra margin of safety.

Either gasoline or diesel power is available. Both the gasoline and diesel engines are rated at 105 net horsepower. Maximum rating of the D330 diesel engine used is 135 horsepower.

Dumping reach of the No. 944 Traxcavator is exceptional, totalling 31.75 inches at maximum height. The maximum dumping height is 9 feet, 1.87 inches. This combination of reach and height permits fast load-spotting when dumping into trucks.

Front tires of the No. 944 are the farthest-forward portion of the machine frame. Such positioning eliminates the risk of damage to truck bodies by contact while loading.

For fast load handling, the bucket is provided with a tip-back angle of 41° at ground level, as on Caterpillar's line of track-type Traxcavators. Tip-back at maximum lift is 50°. Automatic bucket positioner and lift kickout, operated hydraulically, are standard equipment.

The No. 944's torque converter and power shift transmission provide the quick response which a wheel loader needs. In addition to the power shift transmission, the power train includes a manually-shifted range selector transmission, which provides a 4-wheel-drive work range, or 2-wheel-drive travel range.

The transmission is geared to provide 25% faster travel speed in reverse—a factor reducing cycle times.

Control of machine direction and speed is done with two easily-accessible manual levers. The two air-boosted foot-brake pedals are suspended from the compartment forward wall to retain a clean deck area. The left brake contains a neutralizer valve, which shifts the transmission's directional control into neutral when 40-psi brake pressure is applied. The right brake works as a conventional brake pedal that has no interaction with the transmission. Therefore, when actuated, it does not interrupt machine power when such an interruption is undesirable, as in downhill operation.

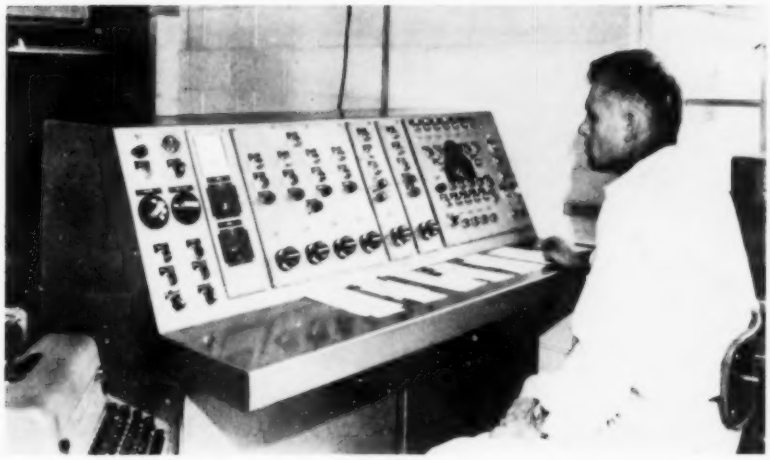
Control of the loader is performed by a high-capacity hydraulic system that delivers full power during critical loading phases. A 40-gpm vane-type pump is driven from an accessory drive direct-connected to the engine, insuring constant live power.

Structurally, the loader lift arms and the tilt linkage differ in several respects from the arrangement on track-type Traxcavators. There are two bell-crank levers, rather than one, and both are mounted on the lift arms. The rear lever is pivoted at its midpoint. Lift arms are made of solid 2-in. plate.

The bucket is equipped with a self-sharpening cutting edge. Its strength is bulwarked by wrap-around corners on this edge. Over-all bucket width is greater than the machine; this protects the tires when the machine is used in such applications as shearing banks or cleaning gutters.

A complete line of attachments is available for the No. 944 Traxcavator. A side-dump bucket, similar to that available on track-type Traxcavators, is offered. Its capacity is the same as the standard bucket. A light material bucket has a capacity of 3 yards, and is recommended for handling material under 2,000 pounds per yard. A 2-yd. quarry bucket is basically similar to the standard bucket, but it has a reinforcing metal plate along the entire underside.

Bucket tooth groups with replaceable tooth tips are available for the standard bucket. Also offered is a fiberglass cab equipped with wide entry doors, windshield wipers and double-strength safety glass.



Electronic Batching Controls

Manufacturer: C. S. Johnson Div., Koehring Co., Department EE, P. O. Box 71, Champaign, Ill.

Claims: Electronic batch controls which can be used either as new plant equipment or as conversion units to modernize any make batch equipment, are now available from C. S. Johnson Co.

Johnson electronic controls give accurate, automatic remote control of batching operations. Simplified control permits dial selection of one of a number of pre-set formulas, and selection of batch quantity. Signal lights keep operator informed at all times of the progress of the batching, without his having to look at the plant. Interlocks prevent improper batching or discharging.

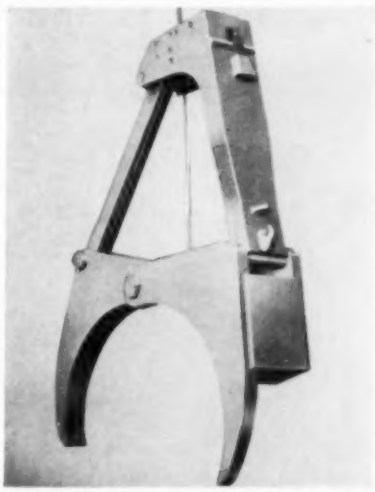
Johnson custom-builds combinations of batching controls to fit individual plant requirements, including, if desired, remote controls for material handling facilities or other plant operations. Equipment can be installed so that discharge of completed batch can be controlled either by the operator at the central control console or by the truck driver at the batcher discharge gates.

In Canada, contact Koehring-Waterous Ltd., P. O. Box 490, Brantford, Ont.

Two-Point Grapple

Manufacturer: Electric Steel Foundry Co., Department EE, 2141 N. W. 25th Ave., Portland 10, Ore.

Claims: Esco is now offering a two-point grapple for loading out logs with a heel boom. A special feature of the new model is its capacity for picking logs out of a tight deck. The Two-Pointer further minimizes log damage by its ability to pivot easily on the log during heeling.



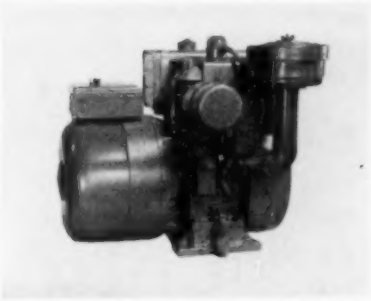
Two-Pointers are available in five heel boom grapple models which can handle logs from 6 to 72 inches.

The lifting line arrangement keeps the grapple in balance, reduces line wear and eliminates strain on the grapple arms. Its design permits straight pull on the lifting line. Side purchase is eliminated.

A one-piece manganese fairlead guide reduces line wear. The manganese throat casting polishes in service, reducing friction. An optional roller assembly is also available as a replacement unit that can be installed in minutes. Either assembly is completely encased in the upper housing.

There are no protruding hubs or pins. Snag-free contours prevent fouled lines.

Electric Plant



Manufacturer: Universal Motor Co., Department EE, Oshkosh, Wis.

Claims: A new Universal self-contained electric generating plant will deliver its full capacity in either 110-volt AC or 220- volt AC current. Two separate convenient receptacles are provided—one for each type of current.

The new model 41-BHS plant is powered with a Briggs & Stratton air cooled engine, and has a capacity of 2,500 watts. The dual voltage plant is expected to find ready acceptance in the construction field.

8-Batch Trailer

Manufacturer: Galion Allsteel Body Co., Department EE, Galion, Ohio.

Claims: A new Galion 8-batch trailer is equipped with remote-controlled hydraulic trippers.

The hydraulically-operated batch trippers, mounted on the body side, provide instantaneous release of batches from a remote control panel inside the cab. This eliminates the need for a "skip boy" to tend the tripping manually.

Another innovation consists of hy-

Continued on page 64

...gentle
enough
to just crack
an egg

...precise
enough
to work in the
hot spots

...speedy
enough
to beat schedules
on production
digging jobs

THE HYDROCRANE'S OIL-SMOOTH CONTROL gives you unbelievable precision and accuracy handling light or heavy loads. That's because there are no gears to jog, no dogs to drop into place, no sudden, jerky control movements. Yet you're talking about a husky crane that handles loads up to 24,000 pounds!

The HYDROCRANE BOOM TELESCOPES to let you get into hot spots that most other cranes simply can't reach. The telescoping action of the Hydrocrane boom works on the move, too, without stopping to pull pins, or add sections. That means you can make your pick in close, hoist the boom, and reach out far to spot the load where you want it. And you are talking about a crane that can reach up to 70 feet high with a jib!

The HYDROCRANE HOE attachment is a profit-making production tool because it, too, is in a class by itself. You get hydraulic-controlled wrist action at the dipper to pry out toughest material, fill faster. You can *reverse* the dipper and dig away from the machine. You can also telescope the boom to extend the reach of the Hydrohoe even farther. And this is a half-yd hoe that will *dig* at 18-ft depth!

The Hydrocrane
Is No Run-Of-The-Mill Crane!

You owe it to yourself to learn the facts about this proved machine. It *is* different . . . in a way that can make a big *extra* in your profit picture. For eye-witness proof, watch a demonstration. Your Bucyrus-Erie distributor will be pleased to arrange it without obligation. Call him today for full details, or write Bucyrus-Erie Company, South Milwaukee, Wisconsin, Dept. 25H59.

BUCYRUS ERIE®

Builds Better Equipment

New Equipment . . .

Continued from page 61

draulically-operated levelizers on the rear tandems to minimize the danger of tipping when body is in raised position. A special 30-in. tailgate guards against dumping damage to tailgate and paving skip.

Designed especially for an eastern Ohio paving contractor, the unique batching unit was tested last fall on a section of the Ohio North-South freeway. Used in conjunction with standard Galion 4-batch dump trucks, the 8-batch trailer effected impressive time savings on over-the-highway hauls of aggregate and cement.

Body design permits quick conversion of the batch trailer to material hauling operations when not in paving use.

Diesel Pile Hammer

Manufacturer: McKiernan - Terry Corp., Pile Hammer Div., Department EE, Dover, N. J.

Claims: A diesel pile hammer delivering a mean energy of 24,000 foot pounds per blow has been added to the McKiernan-Terry line. The large hammer is designated the DE-40. It contains a 4,000-lb. ram, operates at 48 to 52 blows per minute and weighs 11,350 pounds fully equipped for operation.

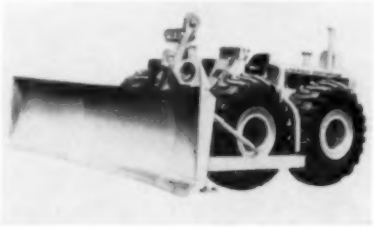
Development of the hammer began two years ago. Last year, several units were in field operation, and drove piles of the type, size and weight previously requiring an 8,000-lb. ram, 18,300-lb. net weight single-acting, steam-air pile hammer.

Other models already in the diesel hammer line are the DE-20 with 2,000-lb. ram, and the DE-30 with 2,800-lb. ram.

Like the previous models, the DE-40 hammer is completely self-contained, requiring neither boiler nor air compressor. A built-in fuel-oil tank holds 19 gallons of diesel fuel. Three gallons of fuel are consumed per hour of normal pile driving operation. A lubricating system powered by a simple, efficient integral pump lubricates all critical points; the hammer requires no manual lubrication.

The new hammer mounts in standard pile hammer leads and is hoisted and operated by a single load line.

Coal Handling Blade



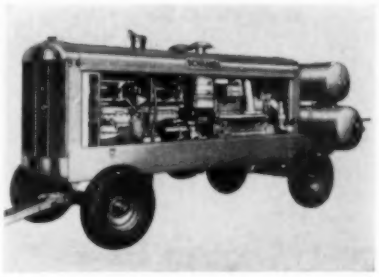
Manufacturer: LeTourneau-Westinghouse Co., Department EE, Peoria, Ill.

Claims: A new coal handling blade is available for use with the 218-hp model C Tournatractor.

The new blade will handle approximately 50% more material than the conventional dozer blade. The "U-blade," as it is called, measures 15 feet from end-bit to end-bit, and it is 4½ feet high. This is three feet wider and a little over a foot higher than the conventional blade. The added size and curvature of the blade causes the coal to keep a live rolling action ahead of the machine. This cuts down on the normal resistance encountered in coal handling.

The U-blade is an optional accessory for the Tournatractor, and it can be factory installed or customer installed. In a straight line comparison between the U and conventional blade, the former can push between 6 to 12 tons, as compared with 4 to 7 tons for the latter over the same distance.

600-Cfm Compressor



Manufacturer: Schramm, Inc., Department EE, West Chester, Pa.

Claims: An improved air compressor, designated model 600-TC, is now offered as the standard 600-cfm unit in the Schramm line of Unistage portable air compressors.

The supercharged compressor of the model 600-TC is driven by the Schramm version of the turbo-charged UDT-1091 International diesel engine, which puts out over 25% more horsepower than other engines of similar capacity.

This power bonus enables the unit to perform under the most extreme conditions of altitude and temperature. The 600-TC will deliver its full 600 cfm of air at 100 psi even under continuous operation at altitudes as high as 10,000 feet.

Because of its low operating speed of 1,200 rpm, this engine offers longer life and requires less maintenance and servicing.

Standard equipment includes electric starter with 12-volt battery and generator; lubricating oil filters on both engine and compressor; liquid cooling system with shrouded fan and coolant pump; air receiver and fuel tank; and automatic speed regulator.

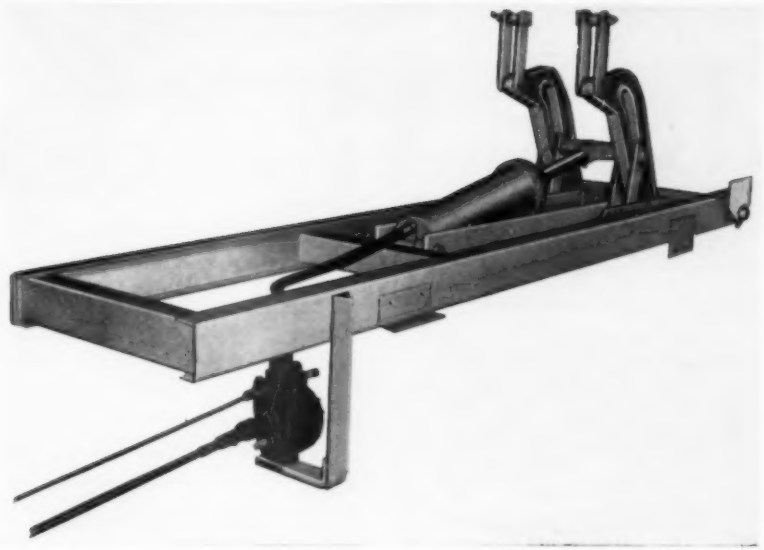
Special equipment available includes automatic hot water and low oil pressure safety shutdowns; electric or manual brakes; special oil pan and scavenging pump for operation at angles up to 20°; and aftercoolers for special applications which require moisture free air.

5-Yd. Excavator

Manufacturer: Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Department EE, Lima, Ohio.

Claims: Big capacity and ruggedness have been engineered into the new Lima types 1800 and 1800-SC excavators.

As a standard shovel the type 1800



is equipped with a 35-ft. boom, a 26-ft. 10-in. dipper handle and 5-yd. dipper; as a coal loading shovel it is equipped with a 7 or 8-yd. dipper; as a crane it has a lifting capacity of 112 tons. Dragline capacity is variable.

The type 1800-SC is a 140-ton capacity crane with ground gripping stability. Extra-long crane booms with jibs are available for high lift work. Both the 1800 and 1800-SC are air-operated rigs.

A truck base is available in two widths—standard width for the type 1800 and extra wide for the 1800-SC.

Each side-frame assembly, including belts, crawler chains and sprockets, is removable as a unit. Counterweight segments are also removable and the backhitch telescopic-type gantry can be folded to a height of 17 feet 5 inches. The main hoist clutches are the internal-expanding type.

Both types are available with diesel or electric power.

Underbody Hoist

Manufacturer: Marion Metal Products Co., Department EE, Marion, Ohio.

Claims: A new Marion Metal single-cylinder 8-in. underbody hoist will carry and dump up to 18½ tons of material under normal conditions. The model, to be known as the HD-829, will fill out Marion's line of heavy-duty hoists.

As a class 12 hoist, it is designed for use primarily on tandem trucks and has ample capacity for work in quarries as well as general hauling assignments.

To give this economically priced 8-in. hoist the strength and lifting power needed to perform dependably on severe jobs, special designing was necessary.

New features include large, strong lift arms of cast alloy steel, heat-treated to withstand wear and to give ample strength. The crosshead is made of heavy rolled steel. Extra strength has been built in the frame to resist bending and torsional stresses. The frame is all-welded with box type cross members. Compared to the HD-8S hoist with a 20-in. stroke, the 829 will have a 22-in. stroke.

The table below gives the normal tonnage ratings using various body lengths with the weight of an average body included.

The HD-829 hoist was developed during the first part of 1958. Since that time, extensive laboratory and field testing has been completed with a high degree of success and customer approval.

During the past 12 months, two units have been tested on-the-job in Kansas and in Illinois. The unit in Kansas has been carrying 13½-ton loads regularly and no trouble of any kind has been experienced. The test unit in Illinois has been working in a quarry. It has been carrying 15 to 16-ton loads while dumping 75 times a day. Here again the owner has experienced no breakdowns and maintenance problems.

BODY LENGTH	PIVOT	AVERAGE NET TONS	MAXIMUM NET TONS
11 feet	15 feet	18½	22
12 feet	15 feet	16½	19½
13 feet	15 feet	15	17½
14 feet	15 feet	13½	16
15 feet	15 feet	12	14½

What if
YOUR CHILD
were in these shoes?

EASTER SEALS
provide skilled care
for crippled children

National Society
for Crippled Children
and Adults
2023 W. Ogden Ave.
Chicago 12, Ill.

TO ADVERTISE: All advertising in this section is payable in advance. Rate $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—10th of preceding month. Example: January closes December 10th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

HEAVY EXCAVATION EQUIPMENT
DRAGLINES, SHOVELS, CRANES,
DRILLS, TRUCKS

15-W B-E elec. drag, 215', 12-yd.
450-W B-E diesel drag, 165' w/extra 10, 12, 13 & 14-yd. buckets.
9-W B-E elec. drag, 165', 10-yd.
9-W B-E diesel drag, 165', 12-yd.
7-W B-E diesel drag, 140', 7-yd.
7400 Marion diesel drag, 175', 13-yd.
7400 Marion elec. drag, 175', 12-yd.
625 Page diesel drag, 160', 9-yd.
621-S Page diesel drag, 125', 7-yd.
71-B B-E Crane w/160' boom.
88-B B-E comb. shovel/drag, w/100' boom.
200-W B-E diesel drag, 125', 6-yd.
5-W B-E diesel drag, 100', 6-yd.
2400 Lima elec. drag, 130', 6-yd.
2400 Lima diesel drag, 130', 6-yd.
4500 Manitowoc drag, 120', 5-yd.
120-B B-E elec. drag, 115', 5-yd.
3900, 3500 & 3000 Manitowoc cranes.
111-M Marion drag, 100', 4-yd.
1601 Lima 4-yd. shovel/drag.
1055 P&H drag, 80', 3½-yd.
1201 Lima dragline, 85', 3-yd.
54-B B-E drag, 80', 2½-yd.
5560 Marion 26-yd. elec. shovel.
5480 Marion 18-yd. elec. H. L. shovel.
151-M Marion 7-yd. elec. shovel.
170-B B-E 6½-yd. elec. shovel.
4161 Marion 6-yd. elec. shovel.
2400 Lima 4½ and 5½ yd. H. L. shovels.
120-B B-E 4-yd. elec. shovel.
111-M Marion 4-yd. standard shovel.
1201 Lima & 54-B B-E standard shovels.
Model T-650 Reich drill truck mtd. rotary and down-the-hole.
Ingersoll-Rand truck mtd. & crawler mtd. Drillmasters.
Euclid trucks, dozers, attachments, etc.

FRANK SWABB EQUIPMENT CO., INC
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa.
GLadstone 5-3658

Euclids—Rear, Botton and Scrapers

12-yd. Bucyrus-Erie dragline.
9-yd. Bucyrus-Erie dragline.
6½-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie dragline.
2½-yd. Bucyrus-Erie shovel and dragline.
5-yd. Manitowoc dragline.
6-yd. Lima dragline.
Other equipment available, not listed above.

WILLIAM LUBRECHT, III
Construction Equipment
211 W. Diamond Ave. Hazleton, Pa.
Phone: GLadstone 5-4041 or 5-0253

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

P & H model 1300 electric shovel with longer than standard frontend, 3-yd. rock dipper, 34-ft. boom, 21-ft. handle, 36-in. crawler treads, serial #6294. One owner. $7,500 worth of both mechanical and electrical spare parts. Location, San Antonio, Tex. Price: $32,500 cash as is, where is. Will finance.

EXCAVATING ENGINEER
Box 3754 South Milwaukee, Wis.

Marion type 7400 walking electric dragline, serial #7504. Equipped with Ward-Leonard control, 650 H.P. synchronous motor, 200 ft. boom with 25-ft. removable section, and an 11-yd. Hendrix type H. S. bucket. Located in Kansas.

EXCAVATING ENGINEER
Box 3752
South Milwaukee, Wis.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 54-B shovel serial #100761, General Motors diesel engine model 6-110 serial #62306RD with Torcon torque converter, 36" crawler pads, rebuilt $59,000
Bucyrus-Erie model 54-B serial #107758, engine Buda model 6DC1879 serial #69131F, rebuilt. Price $55,000
Bucyrus-Erie 54-B shovel serial #60317, powered by Buda model 6DC1879 serial #49926. Completely rebuilt. New 36" crawler pads.. $45,000
Bucyrus-Erie 54-B serial #51079, Buda Lanova engine model 6DC1879 serial #36865F. 30" crawler pads $37,500
Bucyrus-Erie 30-B serial #115715, General Motors engine model 4-71 serial #4A56277 equipped as a dragline, 50' boom, with Page 1¼-yd. bucket $31,000
Or with new dragshovel attachment.. $34,000
Bucyrus-Erie 22-B serial #115749, with Caterpillar engine model D318 serial #5V16453, rebuilt with new cambered boom. Dragshovel attachment $21,000
Bucyrus-Erie 22-B serial #93814, International model UD16 engine serial #UDC9269, as shovel or dragshovel $18,000
Bucyrus-Erie 22-B serial #88390, with Caterpillar engine model D318 serial #5V9892. Excellent condition. As dragshovel or shovel $17,500
Bucyrus-Erie 22-B serial #15297, IHC engine model UD-14 serial #TDFM12041. As shovel or dragshovel $16,000
Bucyrus-Erie 22-B truck crane serial #110886, Buda engine model K428 serial #365717, 40' boom, pendant suspension, hydraulic steering, jackscrew outriggers, wide axle, 12:00 x 20 tires. Excellent condition, 4,000 miles. $25,500
Northwest model 80-D shovel #13326 with Murphy diesel engine model 2—#14590, late 1952 machine. Rebuilt $29,500

THE W. I. CLARK COMPANY
2195 Dixwell Ave. Hamden, Conn.
Phone: New Haven CHestnut 8-2131

Bucyrus-Erie H-3 self-powered Hydrocrane, mounted on 6 x 6 International truck. Has 12-ft. boom insert, 10-ft. jib. This unit is 2½ years old and is in very good condition. Located in Chicago area. Price $10,000

D. D. KENNEDY, INC.
P. O. Box 177
Bellwood, Ill.
Chicago Phone—AUstin 7-4300

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Dallas, Tex.

Bucyrus-Erie, 15-B, 40-10 dragshovel w/Cat diesel engine, Unit 76 tractor type tracks, Unit 79-B extra counterweight and w/set street plates, S/N 118938, motor #D315, 9S-12-683, reconditioned.
Bucyrus-Erie 22-B comb. 60-10 clamshell excavator, 45' boom unit 79 extra counterweight, tractor type tracks, Cat D318 diesel engine, ¾ yard Blaw-Knox clamshell bucket, machine #119704. Excellent condition.
Bucyrus-Erie 22-B comb. 60-10 clamshell excavator, Cat D318 diesel engine, 45' boom, unit 79 extra counterweight, tractor type tracks, ¾ yard Blaw-Knox clamshell bucket, machine #114274, reconditioned.
P & H ½ yard dragline, #59060, fair condition.
Loram model 41 dragline #14432, good condition.
Northwest model 25, ¾ yard dragline, 40' boom, GM diesel engine, machine #11313, reconditioned.
Insley model K-12 hoe, #55690, good condition.
Marion model 362, 1½ yard shovel and dragline, Murphy diesel engine #8488, good condition.
Insley model K-12 dragline w/35' boom, U9 IHC gas engine, ⅜ yard dragline bucket, #1801, reconditioned.
Dragline boom attachment complete with fairlead for ½ yard model K-12 Insley dragline, excellent condition.
Hoe attachment complete for T-35 Schield-Bantam, excellent condition.
Hoe attachment complete for LS-50 Link-Belt, fair condition.
Shovel attachment complete for LS-50 Link-Belt, fair condition.
Shovel attachment for 10-B Bucyrus-Erie, fair condition.

Houston

Bucyrus-Erie 15-B dragline, S/N 86750, Cat D315, 35' boom.
Bucyrus-Erie 15-B dragline, S/N 59821, 35' boom, IHC UD-9, mounted on tractor type tracks, reconditioned.
Bucyrus-Erie 22-B (std.) hoe, S/N 119144, with Esco ¾ yard bucket, IHC UD-525, rebuilt (or as dragline only—no bucket).
Quickway E dragline, S/N 5560, 25' boom, powered by IHC UD-9, mounted on IHC L-184 tandem axle (single drive) truck, reconditioned.
Bucyrus-Erie 22-B dragline S/N 75283, IHC UD-14A, 26" track shoes, 40' boom, Hendrix ¾ yard bucket.
Lorain 30, ½ yard shovel, S/N 10198, gas engine (located at Taylor, Tex.)
Lorain TL-20 dragline, S/N 15456, 35' boom, Cat D4400 diesel, 22" track shoes.
Lorain TL-25 ¾ yard hoe, S/N 23276, Cat D315, 22" shoes.
10' boom insert for standard Bucyrus-Erie 22-B.
Bucyrus-Erie 15-B hoe attachment (straight boom), reconditioned.
Bucyrus-Erie unit 20-A hoe equipment with ¾ yard Esco bucket for B-E 22-B (cambered boom).

Lubbock

Bucyrus-Erie 22-B hoe #92141, Cat diesel engine, #5U10408, good condition.
Northwest 25 truck crane, 45' boom, Dart carrier, #20735, excellent condition.

BROWNING-FERRIS MACHINERY CO.

Dallas	
305 Exposition Ave.	**TA 3-8121**
Longview	
Highway 80	**PL 9-2761**
Lubbock	
2424 Clovis Rd.	**PO 5-7455**
Houston	
2619 Texas Ave.	**CA 5-3231**

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie model 38-B, 1½-yd. dragline with long and wide tracks, 11'6" wide, 7'5" long, 32" pads, 70' boom, pendant suspension unit, 79 extra counter weights. Powered by IHC UD 1091 diesel engine. Total weight 109,360#. Replacement cost $60,915.00. Like new condition. 4 months of rental service is all this dragline has been used. $49,900 F.O.B. Louisville, Ky.

Bucyrus-Erie model 51-B, 2 yd. capacity lifting crane with 100' boom and 20' jib. Long and wide under carriage, 40-ton sheave block. Powered by Buda model 6DCB diesel engine. Crane less than 2 years old—has been in our rental fleet, saw very little service, like new condition. Replacement cost approximately $82,000. $69,000 F.O.B. Louisville, Ky.

Bucyrus-Erie model 22-B heavy duty dragline, clamshell, 60' boom pendant suspension, lifting crane. Long and wide tracks, extra counter weights. Powered by IHC UD-525 diesel engine. Replacement cost $34,499.60. $24,500 F.O.B. Louisville, Ky.

Bucyrus-Erie model 22-B, ¾-yd. capacity basic machine. Powered by IHC model UD-525 diesel engine. Price $19,100 F.O.B. Louisville, Ky.

Bucyrus-Erie model 22-B heavy duty crane, dragline and clamshell 51-20 combination, 30" treads. Powered by IHC UD-525 diesel engine. Price $24,500 F.O.B. Elizabethtown, Ky.

Bucyrus-Erie model 11-B backhoe attachment will fit 10-B Bucyrus-Erie also. #12950. $800 F.O.B. Elizabethtown, Ky.

Lorain model 40, ¾-yd. shovel on crawlers. Powered by gasoline engine. #7912. $4,500 F.O.B. Elizabethtown, Ky.

Lorain model L-80, 1¼-yd. shovel, crawler mounted. Powered by Cat model D13000 diesel engine. Shovel in fair operating condition. $12,500 F.O.B. Elizabethtown, Ky.

P&H model 255 ¾-yd. dragline with Waukesha gas engine. Condition very good. #10926. $6,500 F.O.B. Evansville, Ind.

P&H model 255-A ¾-yd. shovel, crawler mounted. Powered by Caterpillar model 315 diesel engine. #5918. $14,500 F.O.B. Elizabethtown, Ky.

Koehring model 304, ¾-yd. shovel on crawlers. Powered by International model UD-14A diesel engine. #8921. $5,500 F.O.B. Elizabethtown, Ky.

Koehring model 304 shovel front attachment, ¾-yd. capacity. Like new condition. #398. $1,900 F.O.B. Elizabethtown, Ky.

Insley model ¾-yd. hoe attachment. #12951. $1,200 F.O.B. Elizabethtown, Ky.

Lorain model TL-20 dragline with 45' boom, Waukesha gas engine. Under carriage rebuilt. Good operating condition. #5920. $8,500 F.O.B. Evansville, Ind.

Unit model 514, ½-yd. shovel with Chrysler gas engine. #10921. $3,750 F.O.B. Paducah, Ky.

Bucyrus-Erie model 10-B, ⅜-cu. yd. shovel, 1952 model, Buda gas engine. Excellent condition. #12815. $7,500 F.O.B. Evansville, Ind.

Write—Wire or Phone
Jim Waddell

BRANDEIS MACHINERY & SUPPLY CO.
P. O. Box 1705
Louisville 1, Ky.
MElrose 7-4741

Koehring model 205 shovel and hoe, ½-yd., serial No. 5262C, powered with International gas engine #17366, 1948 model.

Model L-41 Lorain hoe with Waukesha gas engine. Serial No. 17832.

Unit model 1020 ¾-yd. shovel, serial No. 51256, powered with Chrysler gas engine.

Model 25 Northwest shovel and hoe, serial No. 9835, with Caterpillar diesel engine 8B8624.

Model 25 Northwest ¾-yd. diesel shovel and hoe, with GMC diesel engine. Serial No. 7723. Located in Seattle.

38-B straight boom 1½-yd. hoe attachment.

54-B bare boom, 60-ft., no point sheaves. Excellent condition.

CLYDE EQUIPMENT CO.
3410 First Ave. So. Seattle 4, Wash.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Lorain model L50K, Serial #25544, Caterpillar D318 diesel engine, combination dragline, clamshell, shovel, 75' crane boom, extended crawlers. Good condition throughout $15,000

Lorain model TL-25, serial No. 19697, with Waukesha gasoline engine, cambered boom with Amsco rock bucket. Machine completely rebuilt $9,500
¾-yd. shovel front available for above machine.

P&H model 255A cambered boom hoe, serial #14436. Excellent value $5,500

Northwest model 25, serial #16381 hoe, ¾-yd. Amsco bucket. Caterpillar D318 diesel engine. Machine completely rebuilt. Other attachments available.

Bucyrus-Erie 22-B cambered-boom hoe, SN 101174. Cat D318 engine. Completely rebuilt. Other attachments available.

Lima model 802, year 1949, serial #5145. Caterpillar 17000 diesel engine, Kohler light plant, combination dragline and clamshell, 60' boom, extended crawlers, 36" treads. Recently completely rebuilt $39,750

Lima model 1201, year 1954, serial #329514. Cummins L1 diesel engine, Kohler light plant, combination dragline and clamshell, 80' boom, high gantry, extended crawlers, 40" treads. Good condition $63,500

Bucyrus-Erie Hydrohoe attachment for H-3 Hydrocrane complete with 18" general purpose dipper, 20" utility dipper, 12" narrow dipper and all necessary fittings. Excellent condition. Complete $750

BINDER MACHINERY CO.
Brighton St. Union, N. J.
MUrdock 8-0060

2—Manitowoc model #3500 excavators, equipped with 45- ft. boom, long handle and 2 and 2½-yd. dipper, powered by Cat D17000 engines. Serial numbers #3647 and #3804.

EXCAVATING ENGINEER
Box 3751 South Milwaukee, Wis.

Model H-2 Hydrocrane mounted on Chevrolet truck chassis, equipped with 2 piece telescopic boom, rear outriggers. Fair operating condition. Priced to sell for $1,950 at our yard.

Model H-2 Hydrocrane mounted on Chevrolet truck chassis, equipped with 2 piece telescopic boom, hydraulically operated rear outriggers. Good condition. Priced at $2,500 at our yard.

Model H-3 Hydrocrane (Bucyrus-Erie) new in 1950, mounted on IHC truck chassis, equipped with 2 piece telescopic boom, tandem outriggers, operator's cab, hydraulic tagline reel, hose, ⅜-yd. clamshell bucket, good condition.

Model H-3 Hydrocrane (Bucyrus-Erie) new in 1953, mounted on GMC truck chassis, equipped with 2 piece telescopic boom, tandem outriggers, operator's cab, tagline reel, hose, ⅜-yd. clamshell bucket, very good condition.

Model 2460 Warner & Swasey Gradall excavator, new in 1957 equipped with GMC model 3031-C diesel engine, mounted on duplex 6x4 standard Gradall carrier. Attachments include 24" digging bucket, 36" digging bucket, heavy duty ripper. Machine used 2 seasons. Excellent condition.

Model 34 Lima ¾-yd. crawler mounted crane-clam-dragline-hoe combination, equipped with Buda gas engine, 35' boom, fairlead, tagline reel, hoe boom with hoe dipper. Priced to sell. Good condition.

Model 375 American crawler mounted dragline-clamshell combination, equipped with series 3-71 GMC diesel engine, long crawlers, fairlead, excellent condition.

Model 357 Unit Wagon crane, equipped with 25' boom, tagline reel, new engine, overhauled machinery, repainted, excellent condition. Priced to sell.

Model 55 Lorain crawler mounted shovel, equipped with UD-18 IHC diesel engine, complete with 1-yd. shovel dipper, machinery partially overhauled and in operating condition. Our asking price is $2,500 but make us an offer.

Model 45 Bay City crawler mounted crane dragline combination, equipped with 45' of boom, tagline reel, Cat D4600 diesel engine. S/N 2503. Machine in good working condition.

Model 22-B Bucyrus-Erie crawler mounted hoe, equipped with long crawler frames, 36" wide crawler treads, Cat D318 diesel engine. Late model machine in excellent condition.

Model H-3 Bucyrus-Erie self-powered Hydrocrane equipped with 3 piece boom, ⅜-yd. clamshell bucket, tagline reel. Gar-Bro concrete bucket, mounted on model S-172 IHC truck chassis. Machine and truck were new in 1957. Used 450 hours. Save on a like new machine.

J. P. WAITE, INC.
3304 West Pierce St. Milwaukee 1, Wis.
EV 4-1900

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Model 2460 Warner & Swasey Gradall excavator. Delivered new in 1957, equipped with GMC diesel engine, 24" and 36" buckets and ripper tooth. In good operating condition. Priced to sell.

J. P. WAITE CONSTRUCTION CO.
3304 W. Pierce St. Milwaukee, Wis.
EV 4-1900

Hoes & Cranes

Link-Belt model LS-80 crane with 50' boom, Rudomatic tagline, Buda gas engine, s/n 7074.

Link-Belt model L3-60 hoe, Buda gas engine, s/n 8128.

1—Michigan C-16 ½-yd. hoe, ½-yd. 22" bucket, 9'9" crawlers, 20" wide, Hercules gas engine JXD #1742230, machine # 3797, 4 years old.

1—Osgood 200—½-yd. hoe with 22" bucket, 11' crawlers, 22" wide, powered by Continental gas engine, machine #6285, 5 years old.

1—Lorain model TL-20 hoe with Waukesha gas engine, six years old, good condition.

1—Unit model 614 dragshovel, ½-yd. bucket, 20" pads, GM diesel engine 2055, excellent condition, 4 years old, serial #54308.

2—Lorain 12-ton ½-yd. truck cranes.

Air Compressors

1—LeRoi 315 air compressor on 4-pneumatic tires, 7 or 8 years old.

1—Joy model WK-80, size 105 portable air compressor with gas engine.

1—Gardner-Denver 105 CFM, 2-stage water cooled air compressor, Hercules OXD-5 gas engine with electric starter on 2-pneumatic tired wheels, serial #162853.

Misc.

1—Bucyrus-Erie 15-B, ½-yd. shovel attachment perfect.

1—Wiley PM215 Patchmobile portable asphalt patching unit on two pneumatic tires, complete with rotary dryer. This unit is new.

1—Ruhr M-1 ½-yd. heavy duty grapple, new excellent buy.

1—Wayne 36" rider industrial vacuum pickup power sweeper, demonstrator, 2 years old.

2—CMC Jeteretes with all accessories. Excellent condition, practically new with all extra accessories.

1—Ross 6-ton pneumatic tired fork lift truck, 10' mast, 14' lift.

1—Used Kennedy Van-Saun revolving scrubber washer screen, 48" dia. x 21'0" long, in excellent shape and complete with all new parts including extra scrubber sections and new sizing screens.

1—Ford 1956 F-600 stake body truck, serial #F602N14988, air brakes, heavy duty dump hoist, 2-speed rear and oversize motor.

1—Vermeer crawler trencher 12"-24" trench, Wisconsin 4-cylinder gas engine.

S. M. CHRISTHILF & SON, INC.
Timonium Rd. & Harrisburg Expressway
Timonium, Md.

1—H-EQ-1 Hoe equipment for H-3 Hydrocrane. Almost new condition. Price: $1,250—F.O.B. St. Louis, Mo.

EUCLID SALES & SERVICE INC.
5231 Manchester Ave.
St. Louis 10, Mo.

Following attachments were removed from model H-3 Hydrocrane stock: H-EQ-1 Hoe equip. w. 18" bucket, 20" utilities dipper with sidecutters, ¾-yd. clamshell bucket, tagline reel, 3¼" heavy-duty digging ram. Net cash price complete—$2,000.

SYRACUSE SUPPLY CO.
294 Ainsley Drive
Syracuse 5, N. Y.

Unit 45 tagline reel complete with fittings, hose and guard for H-3 Hydrocrane. good condition. Price: F.O.B. Minneapolis, Minn. $150.

THE ZECO CO.
2929 University Ave., S. E.
Minneapolis 14, Minn.

H-2 magnet crane, serial #81118 mounted on International L-152, serial #76461, equipped with 24" magnet and SKW generator. Machine as is, in operating condition, price complete $5,000.

MOTT-MANBECK MACHINERY CO., INC.
Latham, N. Y.

MISCELLANEOUS EQUIPMENT

Caterpillar Model D9 diesel tractor, 18A-1900 series, equipped with Caterpillar model 9S cable controlled bulldozer, Caterpillar model 30 front mounted single drum cable control, ATECO model HR D9 hydraulic controlled rock ripper, with one shank, tractor equipped with electric starting, oil clutch crankcase guard, lights, roller guards, 27" wide grouser tracks. $34,500.

Caterpillar model D8 diesel tractor, 2U-20000 series, equipped with Gardner-Denver model WH600 tractor mounted compressor, Gardner-Denver model JMA hydraulic pump, Gardner-Denver model JTB tripod type boom, two (2) Gardner-Denver model D99DT derrick type drill, Gardner-Denver chain feet mountings, with 27" cone for 12 foot steel changes, electric starting, crankcase guard, dry type air cleaner. Machine in excellent condition. $24,500.

Caterpillar model D7 diesel tractor, 5T-18000 series, equipped with Caterpillar model 2A front mounted cable control unit, Caterpillar model 7 A angle blade bulldozer, electric starting, crankcase guard, 22" wide grouser tracks. Good condition. $12,500.

Caterpillar model D6, 24" diesel tractor, 9U-1200 series, equipped with Caterpillar 46 front mounted hydraulic control, new Caterpillar model 6A hydraulic controlled angle blade bulldozer, electric starting, crankcase guard, 20" grouser tracks. Good condition. $13,500.

Caterpillar model D6, 60" diesel tractor, 8U-9200 series, equipped with Caterpillar model 6S hydraulic controlled bulldozer, Caterpillar model 46 front mounted hydraulic control, crankcase guard, lights, electric starting, oil type flywheel clutch. Machine in good condition. $14,500.

International model TD-24 diesel tractor, TDE-5300 series, equipped with Bucyrus-Erie straight blade bulldozer, Bucyrus-Erie model P-29 rear mounted double drum cable control unit, seven roller track frame, 22" grouser tracks. Good condition. $10,750.

Allis-Chalmers model HD-20 diesel tractor, HD20H-5900 series, powered by GMC diesel motor, torque converter, crankcase and roller guards, electric starting and push plate. Tractor in fair to good condition. Price on application.

Allis-Chalmers HD-21 torque converter, diesel tractor HD21A-8500 series, equipped with Gar Wood model 281 rear mounted double drum cable control unit, Gar Wood straight blade bulldozer, roller guards, crankcase guard, lights, 26" grouser tracks. Good condition. $19,500.

Allis-Chalmers model HD-21 diesel tractor, HD21A-8200 series, equipped with torque converter, Gar Wood straight blade bulldozer, Gar Wood rear mounted cable control unit, electric starting, roller guards, crankcase guard. Good condition. $19,500.

Allis-Chalmers model HD-21 diesel tractor, HD21A-7700 series, equipped with push plate, lights, electric starting, torque converter, crankcase and roller guards. 26" wide grouser tracks, dry type air cleaners. Tractor is in good condition. $16,000.

Allis-Chalmers model HD-19 diesel tractor, 1600 series, equipped with Gar Wood model HD-19R straight blade bulldozer, track roller guards, electric starting, lights, torque converter. Tractor in fair condition. $2,500.

Allis-Chalmers model HD-16 tractor, HD16AC-600 series, equipped with Gar Wood model CT-16 straight blade bulldozer, Gar Wood model 281 rear mounted double drum cable control unit, electric starting, lights, front pull hook. Price on application.

Caterpillar model DW20 four wheel diesel tractor, 67C-500 series, equipped with Caterpillar model 45G Lowbowl scraper, with 29.5x29 tires, Caterpillar model 27 rear mounted double drum cable control unit. Scraper is equipped with cable savers, automatic bowl latch; tractor is equipped with electric starting, headlights, air brakes, 14.00 x 24 front tires, 29.5 x 29 rear tires. Good condition. $29,500.

International model TD-14, 74" diesel tractor, TDF-21000 series, equipped with 20" grouser tracks, Cardwell hydraulic angle blade bulldozer, Cardwell model PBI-14 pipelayer, hydraulic system repaired, pipelayer completely checked. Fair condition. $5,500.

International model TD-14 diesel tractor, TDF-20000 series, equipped with Cardwell model PBI pipelayer, serial No. PBI-14-294, with counterweight, less boom, 20" grouser tracks, crankcase guard. Machine in fair condition. $3,700.

Austin Western model super 99 motor grader, serial 99SW-570, powered by GM 4-71 diesel engine, with electric starting, cab, power steering, 6-wheel steering and drive, hydraulic side shift, torque converter, lights, windshield wiper, 12-ft. blade, scarifier. This machine in good condition, a steal. $14,750.

Galion model T-500 tandem drive diesel motor grader, 1300 series, powered by Cummins model JN6BI, diesel engine, equipped with cab, scarifier, torque converter, power steering, hydraulic sideshift, lights, electric starting, four wheel brakes, 13-ft. blade, 14.00 x 24 tires front and rear. Good condition. Low hours, a bargain. $9,500.

Allis-Chalmers model RD-3 tandem drive motor grader, 1200 series, equipped with cab, heater, lights, electric starting, 12-ft. blade, 13.00 x 24 tires front and rear. Good condition. $4,000.

Bucyrus-Erie model 54-B crawler shovel, serial 58882, powered by Buda model 8DAS-1125 diesel engine equipped with Torcon model 3-17CR torque converter, 26-ft. boom, 18 foot handle, 3-yd. Esco dipper bucket, low gantry, mounted on standard 36" flat pads. Good condition. $32,500.

Elgin model 30 street sweeper, serial 1748, powered by Hercules 6-cylinder water cooled gasoline engine, electric starting, lights, hydraulic steering, 9.00 x 20 tires. Fair condition with excellent tires. $2,000.

Elgin model 20 street sweeper, serial No. 1616, powered by Hercules 6-cylinder water cooled gasoline engine. Electric starting, lights, mechanical steering, 9.00 x 20 tires. Fair condition. $1,000.

R. L. HARRISON CO., INC.
P. O. Box 1320 **Albuquerque, N. M.**
CH 7-8811

Cat D4 tractor, 7U series with Hopto hoe, two buckets 24" and 36". Very good condition. $3,850.

PETER FEIKEMA
1854 Ridge Rd. **Munster, Ind.**
TE 8-5618

BUCYRUS-ERIE 51-B
NEW TRACK ROLLER
#269350 AA—½ Price
$65.00

AGGREGATE EQUIPMENT & SUPPLY CO.
811 Lehmann Building
Peoria, Illinois

3—29-T Bucyrus-Erie wire-line blast hole drills.

5—42-T Bucyrus-Erie wire-line blast hole drills.

1—Traylor model TZ gyratory crusher.

1—Covered barge suitable for exhibition work, carrying cement, a work or tool boat. Also could be used as a boat club or floating office.

2—Cast steel 96-tooth, 1¾" D.P., 5" face, 54.86 P.D., hub 6" faced. Bored for 5½", K.S. ¾" x ½". Suitable for use in a tandem drive on a conveyor.

1—International-Harvester model L-210-1952 dump truck (six wheel); with reconditioned motor installed.
Several electric motors ranging in size from 1 hp to 40 hp.

1—A.C. Onan 15-KVA generator set, diesel-powered, 110/220 V., single phase, 3-wire, 60-cycle gasoline starting panel, ammeter, etc. In excellent condition.

NEW YORK TRAP ROCK CORP.
Old Mill Road
West Nyack, N. Y.
Telephone—ELmwood 8-4500

Tractors

Caterpillar D9 tractor, torque converter drive, double drum cable control, angle dozer, tracks and running gear 90% good. Top running condition.

Caterpillar D8 late 2U series, double drum rear mounted cable control, angle dozer, operator guard, excellent operating condition.

Caterpillar D8 tractor, serial #14A1014, angle dozer, double drum cable control, completely remanufactured.

Caterpillar D8 tractor, oil clutch 2U series, angle dozer, double drum cable control, guarded up, operator guard. Good operating condition.

Caterpillar D7 tractor, 17A series, equipped with angle dozer, double drum cable control. Completely rebuilt.

Caterpillar D6 tractor, 9U series, angle dozer, front cable control, Hyster Hyspeed skidding winch. Completely rebuilt.

Caterpillar D4 tractor, 6U series, excellent operating condition, $3,250.

Shovel Loaders

Caterpillar D2 tractor, 5U series, 5 roller non-oscillating frames, guarded up, 12" flat grousers. Equipped with a new Teale loader ¾-yd. bucket. Tractor completely rebuilt.

Allis-Chalmers HD6G shovel loaders, late models, equipped with 1½-yd. buckets, low hours, completely remanufactured, excellent operating condition.

Road Equipment

LeTourneau model J, 8-yd. scraper, good condition.

Wooldridge pull type ripper, excellent condition. New shanks, adapters and points.

Galion 10-ton, 3-wheel steel roller, powered with Buda gas engine, completely checked over and repaired, excellent operating condition.

LeTourneau model H3C ripper, equipped with 2 teeth, good condition.

Power Units & Electric Sets

Caterpillar D8800 power unit, Y arrangement, good condition.

Caterpillar D13000 power unit, Y arrangement, with clutch, excellent operating condition.

Caterpillar D13000 with outboard bearings, integral fuel tanks, steel skid mounted, starting engine rebuilt, balance of unit checked over, good operating condition.

Used Shovels & Cranes

Two—40 ft. Bucyrus-Erie 22-B crane booms, very little use, good condition.

P&H ¾-yd. crane with 55-ft. boom, extra counterweight, tractor type tracks, 20-in. flat grousers, powered with Chrysler industrial gas engine, three speed transmission, good condition.

Bucyrus-Erie 38-B shovel, powered with Caterpillar D13000 diesel engine, machine in excellent condition.

Lima model 34W, 20-ton crane mounted on a Wilmott carrier, equipped with air brakes, good rubber, powered with GMC 4-71 diesel engine, rebuilt, good running condition.

Bucyrus-Erie 22-B with 50-ft. crane boom, extra counterweight, Tagmaster tag-line, Caterpillar D318 engine, mounted on a self propelled Maxi carrier, eight 14.00 x 20 tires, excellent condition.

Northwest model 70 with shovel front and 60-ft. dragline boom, Twin-Cities gas engine, operating condition, cheap.

Air Equipment

Gardner-Denver 125 portable air compressors, good condition.

Gardner-Denver WBF portable compressors, 210 cubic feet, four-wheel rubber tired trailers, good condition.

Gardner-Denver UMB drill wagon, with new Gardner Denver D89D 3½-in. hammer, 4-ft. power feed, excellent condition.

Gardner-Denver S48 jackhammer, excellent condition.

Ingersoll-Rand 315 Gyroflo rotary air compressor portable, rubber-tired trailer, powered with GMC diesel engine, excellent condition.

Rock Equipment

Pioneer 46VE crushing plant with all conveyors and accessory items, excellent condition. Price and particulars on application.

Pioneer 3 x 10 two-deck, four bearing vibration screen, 90 days use, excellent condition.

Pioneer 6' x 30" type A two-chain apron feeder with flared side board, 90 days use, excellent condition.

Pioneer apron feeder, 36" x 8', good condition.

Barber-Greene model 82A heavy-duty paving travel mixer. Price and particulars on application, good operating condition.

Barber-Greene model 848 heavy duty mixer, pugmill, price and particulars on application.

WESTMONT TRACTOR CO.
150 East Spruce **P. O. Box 1445**
Missoula, Montana

MISCELLANEOUS EQUIPMENT

EXCAVATORS
Increase Your Income

Convert your spare time into steady income selling most popular line of belts and buckles with customer's personal initials, first name or nickname with miniature replicas of actual clams, shovels, draglines, backhoes, scrapers, bulldozers, graders, heavy dirt removers, etc., beautifully enameled also lapels, tie clasps, key chains, money clips, and cuff links. Excellent repeat business. We furnish you with refundable complete sales kit. Really nice part-time money producing items. For full particulars, write to

HOOK-FAST SPECIALTIES, INC.
Factory—16 Eudora St. P. O. Box 1425-E
Providence, R. I.

GRADALLS

Model 2460 mounted on 6 x 4 carrier. Powered by Cummins model J61P diesel engine. Complete remote controls. Like new—two months use. Replacement cost $34,520.00 (from our rental fleet.) $31,800.00 F.O.B. Louisville, Ky.
Model 2460 with all standard equipment. Mounted on Gradall carrier, powered by IHC UD-370 diesel engine. $29,000.00 F.O.B. Louisville, Ky.
Model 2460, mounted on crawlers. Powered by International UD-370 diesel engine. Complete remote controls. $26,420.00 F.O.B. Evansville, Ind.
Gradall mounted on White 6 x 4 tandem truck. Gradall powered by International diesel engine. Available with three extra buckets. #6911. $8,950.00 F.O.B. Louisville, Ky.

Write—Wire or Phone
Jim Waddell
BRANDEIS MACHINERY & SUPPLY CO.
P. O. Box 1705 MElrose 7-4741
Louisville 1, Ky.

HELP WANTED

Wanted—Superintendent
Must be capable in all phases of highway and bridge construction. Location New England with established firm. Permanent position if qualified. State qualifications, references and salary desired. Write:

EXCAVATING ENGINEER
Box 3753
South Milwaukee, Wis.

When writing advertisers, please say you saw it in Excavating Engineer

Thank You

Notes from the Manufacturers

Brunner & Lay, Inc., Franklin Park, Ill., has named four new sales representatives for its drilling tools line. H. P. Andrews is assigned to Louisiana, Mississippi and eastern Texas; J. F. Fitzpatrick to Iowa, North and South Dakota, Minnesota, Nebraska and Wisconsin; B. E. Hartman to Arkansas and Oklahoma; and Lloyd Martin to west Texas and New Mexico.

Bucyrus-Erie Co., South Milwaukee, Wis., has announced that Seabrook Machinery, Inc., Tallahassee, Fla., and Albany, Ga., has added all-hydraulic Hydrocrane machines to the B-E line of excavators it distributes in north-central Florida and southwestern Georgia. Seabrook now offers sales and service on the full line of ⅜ to 4-yd. convertible excavators and cranes; 10 to 45-ton Transit Cranes; Hydrocrane lifting cranes in 5 and 12-ton capacities; and the Hydrocrane excavator equipped with clamshell, hoe or shovel attachment in ⅜ and ½-yd. sizes.

Eimco Corp., Salt Lake City, Utah, has announced the promotion of William M. Phillips to the post of manager of its southern district. He will be in charge of sales of the Birmingham (Ala.) and Houston (Tex.) offices, primarily concerned with the marketing of products of Eimco's filter and process engineers divisions. Eimco also announced the appointment of Dorace Dodd to the post of assistant manager, tractor division, southern district.

Ellicott Machine Corp., Baltimore, Md., is observing its 75th year in the dredge manufacturing business. The founder, Charles Ellis Ellicott, headed the company until his death in 1942. His son, C. Ellis Ellicott, Jr., succeeded him. In 1957, the latter became chairman of the board, and Allan W. Mund, formerly vice president and general manager, was named president. Today Ellicott designs and builds all types of mechanically and hydraulically operated dredges; floating excavators, including dipper, grapple and bucket-line units; sea-going hopper dredge machinery; and a varied group of hydraulic pipeline cutterhead dredges ranging in size from 6 to 36 inches (diameter of discharge pipe).

International Harvester Co., Chicago, Ill. has established four regional offices for engine sales of the company's construction equipment division. Eastern headquarters are located at 10 E. 40th St., New York City; north-central region, at the division's plant in Melrose Park, Ill.; southwest region, at 1809 S. Lamar St., Dallas, Tex.; and western region, at 2858 Cypress St., Oakland, Calif.

Koehring Co., Milwaukee, Wis., has appointed Paul A. McDonald district manager for the states of California, Nevada, Utah and Arizona. For the past 10 years he has been a manufacturer's representative for off-highway hauling equipment. McDonald also has been connected with several major construction firms, and before that spent 13 years with the California division of highways.

Unit Crane & Shovel Corp., Milwaukee, Wis., has completed arrangements with Steel & Co., Ltd., Sunderland, England, giving Unit distribution and manufacturing rights under license for the Coles line of all-electric, gas and diesel driven mobile cranes in the United States, Canada and Mexico. A complete range of sizes, from 5-ton to 50-ton capacity, will be available. Under the reciprocal licensing arrangement, Unit products will be manufactured and distributed by Steel in all world markets except Australia, South Africa, and the Benelux countries, where Unit already has licensing agreements. Unit's Milwaukee plant will continue to supply its products to the United States, Canada and Mexico. The Unit line of power shovels, cranes, draglines and hoes on crawlers and rubber tires will serve to round out Steel's line, which consists primarily of mobile lifting cranes mounted on rubber tires.

NOT in the Contract

A confirmed alcoholic finally had been cured of the bottle, and his psychiatrist was about to test him to see if the cure was complete. "Now, then," he said, "what does the name of Gordon convey to you?"

The ex-drunkard thought. "Wasn't that the name of a famous general?" he said.

"Very good," said the psychiatrist. "And what does the name Haig mean?"

"He was a noted earl," was the reply.

"Excellent," said the psychiatrist. "And now for the supreme test. What does Vat 69 mean to you?"

The man sat deep in thought. At last he looked up and asked: "Isn't that the Pope's telephone number?"

Lady: "Do you charge batteries here?"

Garage operator: "Yes, madam, sure do."

Lady: "Then put a new one in this car and charge it to my husband."

As they planned a trip to New York on their honeymoon, the bride-to-be thought it would be helpful if she learned to drive so she could spell her husband at the wheel. She took several driving lessons, and just before the wedding was awarded a beginner's permit.

After the wedding, the happy couple drove off in a cloud of rice and old shoes. But guests and families alike were astonished when they returned a few minutes later, the bride blushing with confusion.

"Goodness," she gasped, "I forgot my beginner's permit!"

Father to teen-age son: "Mind if I use the car myself tonight? I'm taking your mother out and I want to impress her."

A new foreman had just taken charge of his construction job and many of the men had not yet met him. About the middle of the forenoon he was making a tour of the site to familiarize himself with the layout when, on passing a small enclosure, he saw two workmen inside who were sitting and smoking. Before he had an opportunity to speak, one of the men said, "Hello, what are you doing, stranger?"

"I'm Dodgen, the new foreman," was the reply.

"So are we. Come in and have a smoke."

"Joe," said the contractor to his long-time golfing partner, "as long as we've been playing golf together I've never heard you swear."

"Yes, it's true I don't cuss," said Joe, "but I'll have to admit when I slice, I spit; and wherever I spit, the grass doesn't grow any more."

After the psychiatrist had finished his lecture on love problems, he invited questions from his audience. A little man in the last row stood up, blushed and murmured, "You said that hysterical girls were calmed down easily by kissing them."

"That's right," agreed the psychiatrist. "Did you want to know more about it?"

"Just one thing," stammered the little man in confusion, "where can I find a hysterical girl?"

A toothless termite went into the tavern and asked, "Where is the bar tender?"

Pedestrian: "Sorry, my good man, but I just don't give money to men on the street."

Panhandler: "You want that I should open an office?"

Women aren't embarrassed when they buy men's pajamas, but a guy purchasing a nightgown acts as though he were making a deal with a dope peddler.

The teacher decided the students in her class should write a girl or boy in a foreign country, and little Willie was handed the name of a girl from Holland for his pen pal.

That night he shocked his mother by saying, "Guess what, Mom, I got a girl in Dutch."

A small-town Texas banker, instructed to forward some counterfeit bills to the Federal Reserve Bank, wrote:

"The money is being sent by Post-office Money Order."

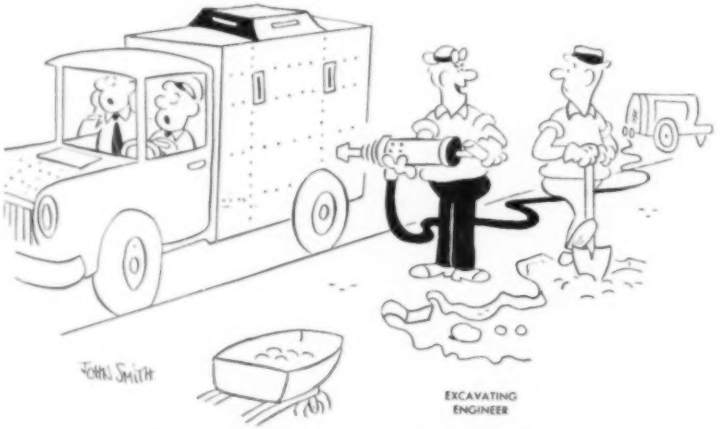
Upon entering a room in a Washington hotel, a woman recognized a well-known government official pacing up and down and asked what he was doing there.

"I am going to deliver a speech," he said.

"Do you usually get very nervous before addressing a large audience?"

"Nervous?" he replied. "No, I never get nervous."

"In that case," demanded the lady, "what are you doing in the Ladies Room?"



"Want to see a couple of guys wake up with a start?"

Brinson-Allen's No. 14 is equipped with Preco Automatic Blade Control. This exclusive factory-installed attachment for all Caterpillar Motor Graders saves money on a wide range of applications. With the desired slope set on the dial, the operator only has to control depth of cut. The transistorized unit automatically maintains blade slope within 1/8 inch in ten feet.

CAT NO. 14 MOTOR GRADER INCREASES PRODUCTION 20 PER CENT

This Cat No. 14 Motor Grader handles subgrade and base on the western approach of the Interstate System highway bridge between Tampa and St. Petersburg, Fla. Charlie Clyatt, superintendent on the job for owner Brinson-Allen of Tampa, reports, "We have increased production about 20 per cent. The No. 14 has more weight, traction and power, gets the job done quicker. It has never failed to stay well ahead of the base crew."

Here's why the big No. 14 excels in weight, power and traction: It weighs a hefty 29,280 lb. . . . the 150 HP turbocharged engine delivers power to spare . . . 14:00-24 tubeless tires all around provide excellent stability. The 12 ft. (standard) or 14 ft. (optional) moldboards with ample throat clearance between moldboard and circle assure you of greater loads than ever before.

But this versatile motor grader has more than sheer power and weight. Features like the dry-type air cleaner which removes 99.8 per cent of the dirt from intake air means longer service life. The exclusive Caterpillar oil clutch, which operates up to 2000 hours without adjustment, practically eliminates down time for clutch repair. Operator has excellent visibility to front wheels, toe of blade and circle. The power steering and power brakes are designed for operator efficiency and high productivity. These are just a few of the reasons why the No. 14 is the most profitable and productive motor grader in its class.

Heavy-duty circle and moldboard on the No. 14 provide big load carrying capacity. Circle and moldboard are strong to match engine power and can absorb the punishment of rough work. Mechanical blade controls provide precise, fast blade adjustment and positive hold.

See your Caterpillar Dealer and ask him to demonstrate the No. 14 on the toughest application *you* can find. See for yourself how the rugged No. 14 can handle the hard work.

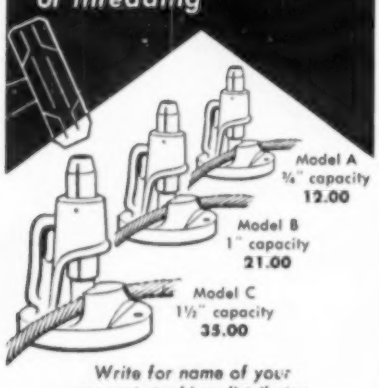
Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

STEP UP PRODUCTION WITH THE NEW NO. 14

WITH A HAMMERBLOW . . . 3 SHARP RAPS CUT WIRE ROPE CLEAN . . . *leave it round, ready for splicing or threading*



Write for name of your nearest stocking distributor

HAMMERBLOW
WIRE ROPE CUTTER CO.

New Trade Literature

Subject: **Electric-Control Scraper**
Content: A 16-page bulletin handsomely illustrates the 28-yd. capacity 360-hp model B Tournapull—largest self-propelled scraper in the LeTourneau-Westinghouse line. Special features emphasized are the various combinations of engine and transmission available; the Power-Transfer differential which automatically shifts power to the drive wheel with the best footing; the instant-response electric controls and motors which perform all of the model B's steering and work functions. Also pointed out is the fact that a 35-ton rear dump or 30-ton crane readily interchange behind the standard model B prime-mover. Ask for form No. TP-433.
Where to get: L-W distributors, or LeTourneau - Westinghouse Co., Department EE, Peoria, Ill.

Subject: **Sheet Piling**
Content: A new 24-page catalog on steel sheet piling has been released L. B. Foster Co. It illustrates typical applications, and discusses standard, rolled and fabricated sections. The catalog also illustrates typical pile arrangements for rectangular and circular cofferdams. Tables list nominal lengths of straight walls and dimensions of pile cells. Special sections describe lightweight sheet piling; H-bearing pile; rail pile; pipe pile; and accessories. Foster points out that renting sheet piling eliminates the need for substantial investments in inventory stocks and tie-up of capital. Ask for catalog 400.
Where to get: L. B. Foster Co., Department EE, P. O. Box 1647, Pittsburgh 30, Pa.

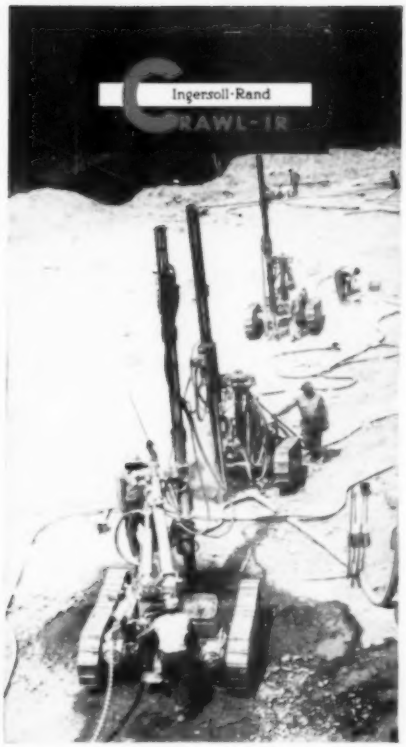
Subject: **Loader Line**
Content: The story of Allis-Chalmers' recently-acquired Deerfield (Ill.) Works is interestingly related in a 12-page booklet. It contains photographs of the Deerfield plant, which produces seven TractoLoader models, and attachments for the Allis-Chalmers crawler tractor line. Engineering developments by the company and what is being done in the field of research for new and improved materials and methods are also discussed. Ask for brochure MS-1348.
Where to get: Allis-Chalmers Mfg. Co., Construction Machinery Div., Department EE, Milwaukee 1, Wis.

Subject: **Wire Rope**
Content: A condensed 4-page catalog lists new up-to-date weights and strengths of both improved plow steel (Monarch Whyte Strand) and extra improved plow steel (PREmium Whyte Strand) wire rope by Macwhyte. Also included are an explanation of wire rope constructions and types, plus helpful information for ordering. Ask for bulletin #6025.
Where to get: Macwhyte Wire Rope Co., Department EE, Kenosha, Wis.

Subject: **Automatic Blade Control**
Content: A six-page bulletin covers Preco's newly-designed all-transistor automatic blade control. The folder explains in detail the wide range of applications to which the automatic blade control can be adapted. The all-transistor mechanism is illustrated and described in detail and is reported to be a greatly simplified system that results in greater dependability, accuracy and ease of service. The Preco automatic control is designed for current model Caterpillar No. 14, No. 12 or No. 112 motor graders—either a new or used machine.
Where to get: Preco, Inc., Department EE, 6300 E. Slauson Ave., Los Angeles 22, Calif.

Subject: **34-yd. Scraper**
Content: International's model 295 Payscraper is the subject of a 24-page two-color catalog. With a 34-yd. heaped capacity, the unit is powered by the International DT-817 turbocharged engine, developing 375 horsepower at 2,100 rpm. The model 295 Payscraper offers speeds up to 33.5 mph; advanced lift frame construction; tapered bowl design; 131-in. cutting width; new 98-in. opening with positive ejection; and simplified design which cuts service time.
Where to get: International Harvester Co., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Weldment Wall Chart**
Content: A "how-to" wall chart in color from Amsco gives step-by-step instructions for replacing tractor grouser bars. It also includes detailed ordering information for manganese or carbon steel bars covering all leading makes of tractors. A similar chart provides instructions and specifications covering two types of shovel dipper tooth repointers and repointer bars.
Where to get: American Manganese Steel Division, Department EE, 389 E. 14th St., Chicago Heights, Ill.



RIGHT ON SCHEDULE

Gyro-Flo powered CRAWL-IR drills average 400 ft. daily in Westchester Granite with 3-inch Carset bits

These three Ingersoll-Rand CRAWL-IR drills, each powered by a 600-cfm Gyro-Flo compressor, helped a New England Contractor to stay right on schedule in removing a million yards of rock for the Elmsford Section of the Cross-Westchester Expressway. Drilling holes with 3" Carset bits, each machine has averaged about 400 ft per day in hard Westchester granite. All tower positioning is hydraulically controlled and 12′ 3" boom swing permits drilling on both sides of the crawlers at a single setting.

The 600-cfm Gyro-Flo rotary compressors offer maximum economy and dependability—smoother running, smaller, lighter, virtually maintenance-free, with air temperatures under 200°F, low oil consumption and closer regulation at all loads from 0 to 100% capacity. Gyro-Flo units are available in 6 sizes from 85 to 900-cfm, for every air-powered job.

Ask your I-R distributor or engineer for complete information on the cost-saving CRAWL-IR Gyro-Flo combination.

Ingersoll-Rand

64A14 ▼ 11 Broadway, New York 4, N.Y.

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

45,000 MILES IN 5 MONTHS . . .

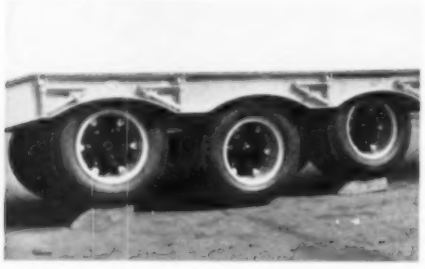
American Utilities Haul the Behemoths* of Construction on this LaCrosse Rig

* D9 * TC-12 * NORTHWEST 6 * KOEHRING 405 * DW21

This DW21 nestles on AU's LaCrosse Three-Axle Trailer; low gooseneck provides ample clearance for the prime mover in conformance to midwest clearance restrictions.

Mr. Versaw, right, applauds the 48" axle spacing and 20" tires that reduces tire wear and makes a smoother haul on his LaCrosse Trailer.

LaCrosse triple axle single point suspension design permits all points of oscillation on the same plane, equalizing load distribution without bending or mechanical distortion. Illustrations above and below demonstrate the flexibility incorporated into the LaCrosse triple axle design.



● It used to be removal of tracks, drawbar, dozer, ripper and even seat pillows to scale down big crawlers and shovels to meet state highway weight restrictions.

But the new, painless way is exemplified by American Utilities, Inc. which moves the D9, TC-12, DW21 and other behemoths of construction on the LaCrosse Triple Axle Lowbed Trailer.

Last summer, this Ralston, Nebr., general contractor hauled the big machines all over a 5-state area, clocking 45,000 miles on its Three-Axle rig in 5 months! Not one iota of trailer trouble either, reports Robert Versaw, the firm's president.

For more trouble-free performance, the firm's 18-ton LaCrosse Tilt-Deck trailer does equally as well.

On-the-go in construction, LaCrosse Trailers are setting impressive performance records in hauling the big machines. A full line of quality trailers provides you with the options you need to be legal in your area. And there's a *written one-year warranty* that gives you extra confidence in your LaCrosse Trailer purchase.

See your dealer who sells the LEADER IN LOWBEDS. That's your LaCrosse Dealer. LC-64

LaCROSSE

LEADERS IN LOWBEDS

LaCROSSE TRAILER CORPORATION

418 Gould Street • La Crosse, Wisconsin